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Northern Minnesota Medical Association and Minneapolis Surgical Society*

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VOL. VIII

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No. 10

SUB-ACUTE BACTERIAL ENDOCARDITIS*

HENRY L. ULRICH, M.D.
Minneapolis

I take the liberty to present two brief case histories of sub-acute bacterial endocarditis in order to call your attention to a change in the point of view which is taking place in the minds of clinicians and pathologists of this center, regarding this disease.

CASE 1.—Miss O. S., a schoolgirl, aged fifteen, entered the University Hospital June 29, 1924, complaining of cardiac insufficiency and pain in the left knee and left ankle with swelling. Four years before this she had had an attack of chorea, with a heart lesion. Since then there had been dyspnea and palpitation on exertion. In April, 1924, the left knee and left ankle had been swollen and painful, which promptly cleared. In May the left elbow and wrist became swollen and painful. This also promptly cleared up. Both of these attacks put the patient to bed for a few days. At the end of May she had an infected mouth. About June 1, she was told she had heart disease and anemia. She was in bed up to June 15. June 19 the left knee again became painful and swollen, and pain persisted until her entrance into the hospital June 29. She had enjoyed good health up to her chorea in 1920. She had had two attacks of pleurisy, the last one in 1923. A tonsillectomy was done in 1920. Menstruation started in 1923. She menstruated three times. Since October, 1923, there had been no menstrual flow.

Her physical examination on entrance revealed: lungs clear, abdomen negative. Mitral type of heart. Many infected teeth. Left ankle and foot swollen. Her blood picture was: hemoglobin 65 per cent, r.b.c. 3,000,000, w.b.c. 11,000. The differential count gave 62 per cent polymorphonuclear cells. There were red and white blood cells in the catheterized specimen of urine. The blood culture was negative.

A diagnosis of sub-acute rheumatic fever, cardiac insufficiency, valvulitis,—double mitral, possibly aortic,—possible bacterial endocarditis was made.

During her stay, her temperature range was never above 102, with afebrile periods. During July, the blood cultures were negative. In August a streptococcus viridans was isolated from the blood and petechiae were present over the trunk and extremities. A progressive anemia was noted. The leucocytes ranged from 11,000 to 18,000. In

October an embolus of the left cerebral artery was noted, and in November a meningitis developed. The patient died November 23, 1924.

The clinical diagnoses were as follows:

1. Acute rheumatic fever.
2. Chronic valve defect (mitral insufficiency, stenosis).
3. Sub-acute bacterial endocarditis.
4. Focal nephritis (glomerular, embolic).
5. Vegetations on aortic leaflets (not found at autopsy).
6. Hemiplegia (cerebral embolus).
7. Acute meningitis (terminal, streptococcus viridans).

Postmortem: At autopsy, beside the embolic processes in the kidneys, spleen and brain, the interesting organ was the heart. This presented the following points (notes by Dr. E. T. Bell): Maximum width 12.5 cm. There was marked dilatation of the right auricle and moderate hypertrophy of the left ventricle. The epicardium was smooth and clear. The weight 255 gms. There were no lesions on the right side. The auricle showed numerous mural thrombi extending from the mitral valve up onto the left side of the chamber. These thrombi were fairly firm, but had soft superficial portions. The mitral showed a moderate, diffuse thickening. There were numerous thrombi attached to the leaflets. Most of these were fairly firm, but had softened superficial portions. There was no lesion at the root of the aorta.

Pathological Diagnosis:

1. Sub-acute bacterial endocarditis (mitral valve and left auricle).
2. Encephalomalacia due to embolism of left middle cerebral artery.
3. Cloudy swelling of the liver and spleen.
4. Old infarct in the spleen and kidneys.

Additional histological notes: Embolic glomerular nephritis. Valve showed proliferation of thrombi, Aschoff bodies in the myocardium. Liver shows passive congestion.

CASE 2.—Miss M. H., clerk, aged twenty-three. Patient entered the General Hospital, February 18, 1924, complaining of dizziness, weakness, palpitation and cough. In January, 1924, she had had an attack of rheumatism, which cleared up in two weeks and was followed by the symptoms just mentioned. The past history elicited scarlet fever at the age of four; tonsillectomy at nineteen; at seventeen she had had an attack of rheumatism, similar to the attack of January, 1924, but more severe, as she was confined to bed for a month, and after this attack she noticed edema of the ankles and dyspnea on exertion for a long time. The family history was negative. The physical examination was as follows: Chest clear; abdomen negative; neurological examination negative; heart enlarged, with double mitral murmur. The laboratory findings were: Hemoglobin 80 per cent, r.b.c. 4,770,000,

*Presented before the Minnesota Academy of Medicine, March 11, 1925.

w.b.c. 5,800; differential of 73 per cent polymorphonuclear cells; urine, catheterized specimen: many hyaline and granular casts present, few r.b.c., specific gravity 1.025, a trace of albumen. *Impression:* (1) rheumatic fever; (2) endocarditis with decompensation; (3) valvular defect,—mitral stenosis with regurgitation; (4) possible pericarditis with effusion; (5) possible renal involvement.

Several days later an aortic lesion was made out and petechiae were noted on the lower extremities. Blood pressure 104-40, and spleen was palpated. The temperature ranged to 103. This patient grew progressively worse. The hemoglobin dropped to as low as 38 per cent. The leucocytes were never lower than 5,000. Blood cultures were positive on February 20 and on March 7. The patient died April 6, 1924.

The *clinical diagnoses* were:

1. General septicemia.
2. Sub-acute bacterial endocarditis.
3. Valvulitis,—mitral and aortic.
4. Acute fibrinous pericarditis.

At *postmortem* there was evidence of cardiac death. (Notes by Dr. Kano Ikeda.) The liver was enlarged. There was obliteration of the pericardial space. The heart measured 14 cm. at its greatest diameter, and weighed 365 grams. The myocardium was pale and soft. There were fresh vegetations on the mitral valve, an irregular growth extending upward from the posterior mitral to the aortic, where a few additional patches of vegetations were present. There were small scattered islands of vegetation scattered over the endocardium of the left ventricle just below the aorta. The root of the aorta showed a few yellowish raised patches. The spleen weighed 240 gms.

The *pathological diagnoses* were:

1. Sub-acute bacterial endocarditis (mitral and aortic).
2. Adherent pericardium.
3. Streptococcal septicemia.
4. Embolic glomerular nephritis.
5. Cloudy swelling of the spleen, liver and kidneys.
6. Infarction in the spleen.
7. Acute ulcerative colitis.
8. Hypostatic congestion with beginning pneumonia of the right lower lobe.
9. Generalized petechiae.

Additional histological examination showed an embolic glomerular nephritis, two types of proliferation and infected thrombi on the valves.

These two cases presented typical symptoms of rheumatic endocarditis at the time of their inception at the hospital. Only a hospital staff, acquainted with the views which will be given, would have included the supposition of bacterial endocarditis at the beginning of these two girls' illnesses. Other writers have called attention to the fact that bacterial endocarditis is often ushered in with symptoms simulating rheumatic fever. This clinical similarity is a striking point, when it dawns on one that the two diseases may have the same etiological origin. Clinically, they criss-

cross in our minds and it has been gradually coming to us, that rheumatic and sub-acute bacterial endocarditis are milder and severer forms, respectively of one and the same disease. Their difference lies in the local reaction in the heart and this variation in reactivity accounts for the differences in the clinical as well as the prognostic picture.

We have been accustomed to think of these two diseases as two separate clinical entities: in rheumatic endocarditis, the etiological agent being unknown; in the sub-acute, the streptococcus viridans being the common offender. In acute rheumatic fever the prognosis is exceedingly good. (Thayer¹ was only able to collect twenty-five cases at post-mortem in thirty-five years at the Johns Hopkins Hospital; Dr. Clawson,² seventeen cases in fifteen years.) In bacterial endocarditis, the prognosis is practically hopeless. In rheumatic endocarditis, the absence of embolic processes, including splenic enlargement, sharply differentiates it from the sub-acute type. The age incidence in the former is in the first three decades of life; in the latter, it is in the second, third and fourth decades. Pericardial complications in the rheumatic endocarditis is given as a differential factor from that of the sub-acute. The blood picture is also supposed to be different; in rheumatic endocarditis there is possibly less anemia, and perhaps more leucocytosis. Anatomically, the pictures certainly are different. In rheumatic endocarditis one has verrucous thickening on the valves and Aschoff bodies in the myocardium; in the sub-acute, the mural vegetations and the softer vegetations on the valves.

Recently, Dr. Clawson³ of the Pathological Department of the University of Minnesota has gone over these laboratory variations and finds there are no distinctions. He has been able, under adverse conditions, to get positive blood cultures of streptococcus viridans, in twenty-five cases of acute rheumatic fever, which is 50 per cent positives. Under ideal conditions, he thinks he can raise this to 80 per cent positives. In the sub-acute endocarditis he has had 90 per cent positive streptococcus viridans blood cultures.

Immunologically, he divides these organisms into two groups: one the homologous group, the other the heterogeneous group. The homogeneous group agglutinated with heterologous sera from both clinical types; the heterogeneous only with homologous blood. In animals (rabbits), similar lesions are provoked from the homogeneous strains

of either clinical type. The isolation of the same organisms, with Koch's postulates observed, is additional proof of the single etiological origin of these two clinical types.

The explanation of the anatomical differences of the two clinical types is purely one of local reactivity of tissues. In one the proliferative predominates; in the other the exudative.

In the valves affected, he finds no difference. In the sub-acute, the aortic is supposedly not common. Out of eighty cases, he finds twenty-three aortic involvement alone. In the rheumatic group, there was no pure aortic lesion alone. But out of one hundred and fifteen old rheumatic cases, there were twenty-one aortic lesions alone. Mural involvement was present in 39 per cent of the sub-acute group and in none of the rheumatic group. Thayer finds mural involvement in 20 per cent of his cases. The incidence of pericarditis in sub-acute endocarditis is 20 per cent; in rheumatic 63 per cent. This has always been considered a point of differentiation. Clawson looked up the records in old healed lesions of rheumatic type, and finds there is pericarditis present in 20 per cent. This high incidence, 63 per cent, in acute rheumatic cases is due to the fact that death occurs from pericarditis, therefore the incidence of pericarditis is apparently high, because these cases are more apt to die.

Splenic enlargement is found in 25 per cent of the sub-acute group, and only 5 per cent of the rheumatic group.

The blood picture showed a hemoglobin in rheu-

matic endocarditis ranging from 90 per cent to 60 per cent. Out of the sub-acute cases there were fifteen below 60 per cent. The red counts averaged the same in the two diseases. There is a tendency to leucocytosis in both diseases. In the rheumatic there were two cases below eight thousand, and in ten cases out of forty-nine sub-acute cases. The blood pictures are suggestive of a difference, but this is not conclusive.

So that the real differentiation of the two clinical entities is in the embolic processes. We have the same organism present, practically the same blood picture and the same clinical picture until embolic processes are evident.

To summarize, all points of difference in these two clinical types are found to be apparent and not real. Clinically, the only striking variation is the evidence of embolic processes, and this depends on anatomical variation, which again depends on the reactivity of the tissues of the heart. While we do not wish to destroy the clinical entity of these two types, we do wish to emphasize their common origin. We still have to differentiate the two for prognostic reasons. The finding of *streptococcus viridans* with an active heart lesion, however, does not indicate the presence of a sub-acute endocarditis, in the usual sense of the word. Not until evidence of embolic processes is obtained, can we tell that we are dealing with the grave form of endocarditis.

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1. Thayer, Wm. J.: *H. Bul.*, vol. 36, p. 98.
2. Clawson, J. B.: Personal communication.
3. Clawson, J. B.: Personal communication.

THE NEW PHARMACOPEIA

The United States Pharmacopeial Convention met in Washington in May, 1920, and appointed a committee to revise the Pharmacopeia of the United States. The new Pharmacopeia was placed on sale August 15; it becomes official January 1, 1926. The responsibility for the scope of the new Pharmacopeia was placed on the twenty-one members who held the degree of Doctor of Medicine. Consequently, the new book should more nearly represent rational medicine than some of the preceding revisions in which pharmacists and pharmaceutical manufacturers largely controlled the situation. From the standpoint of the physician, the most noteworthy feature of this revision is the fact that but forty new drugs and preparations were added, while 192 have been deleted. The additions are drugs which give promise of therapeutic worth: thirty-one of them are already described in New and Non-official

Remedies. The omission of such substances as arnica, calcium hypophosphite, cerium oxalate, coriander, grindelia, hops, lactucarium, three lithium salts, matricaria, prickly ash, musk, parsley, pepper, saw palmetta, stillingia, sumbul and taraxicum is a distinct aid to scientific medicine. The retention of sarsaparilla is to be regretted. An effort has been made to simplify the Latin titles. Examples are: the substitution of *Cinchophenum* for *Acidum Phenylcinchoninicum*; *Methenamina* for *Hexamethylenamine*; *Liquor Pituitarrii* for *Liquor Hypophysis*. Whereas the present Pharmacopeia requires that two drugs and their preparations be standardized biologically, the new book requires that eight must be so standardized. The unit of measurement, the milliliter (abbreviation "Mil"), which is used in the present Pharmacopeia has happily been abandoned again and the familiar cubic centimeter (abbreviated "c.c.") restored.

(*Jour. A. M. A.*, Aug. 29, 1925, p. 678.)

CORRECTIVE LEGISLATION*

FRED M. McLUCAS
Fort Wayne, Indiana

By an amendment passed at the last session of the Minnesota State Legislature, the Statute of Limitations governing actions for malpractice in the State of Minnesota was changed from six to two years. The present law, as signed by the governor March 27, 1925, and which will become effective three months thereafter, is as follows:

"Section 9193, Gen. Stat. 1923. The following actions shall be commenced within two (2) years: 1. For libel, slander, assault, battery, false imprisonment, or other tort, resulting in personal injury, and all actions against physicians, surgeons, dentists, hospitals, sanitaria, for malpractice, error, mistake, or failure to cure, whether based on contract or tort; provided, a counterclaim may be pleaded as a defense to any action for services brought by a physician, surgeon, dentist, hospital or sanitarium, after the limitations herein described notwithstanding it is barred by the provisions of this chapter, if it was the property of the party pleading it at the time it became barred and was not barred at the time the claim sued on originated, but no judgment thereof except for costs can be rendered in favor of the party so pleading it."

Every member of the Minnesota Medical Association, every member of the medical and dental profession, every hospital and sanitarium is highly pleased and delighted with this accomplishment.

In development of the subject assigned it must be understood that every rule of law governing malpractice litigation has its source in either the acts of your State Legislature or in the judicial decisions of your Supreme Court.

I wish to call your attention to some features of the present law of this state with respect to the defense of malpractice cases which cause a decided hardship to the defendant in such a suit and which are a great handicap in the defense of these cases.

1. An expert, according to the judicial decisions of this state, is permitted to express an opinion as to the degree of care and skill exercised by the defendant in a malpractice case, or the propriety or impropriety of his treatment, from the results obtained from that treatment.

This rule of law contravenes some very just and salutary principles of law. One of the fundamen-

tal principles of malpractice law prevailing everywhere and pronounced by your Supreme Court, is to the effect that a bad result is no evidence of negligence on the part of the attending physician nor does a bad result raise a presumption that the physician has been negligent in his treatment. This pronouncement of law has been beautifully stated by your Supreme Court in its decision of the case of *Martin vs. Courtney*, August 8, 1902, as cited in 87 Minn. 197, 91 N. W. 487, where this language is found:

"The legal obligation of the physician to his patient, where his conduct is questioned in an action of this character, demands of him no more than the exercise of such reasonable care and skill as is usually given by physicians or surgeons in good standing of the same school of practice. (Citing authorities.) To exact more than this would be an unjust imposition upon the physician, to encourage expectations of miraculous power that could not be fulfilled, for he is not an insurer of absolute success. The white headstones and monuments that glisten in the sunshine within the sacred precincts devoted to the repose of the dead in the suburbs of every city and hamlet in the land testify with unerring certainty that man is mortal, and the most effective efforts of the healing art are incapable of resisting the conqueror of all."

Your Supreme Court has given some very convincing reasons why a bad result is not of itself evidence of negligence on the part of a physician in his ministrations to the sick and injured. These reasons are set forth in the following quotation from *Williams vs. Poppleton*, 3 Ore. 139, as stated and adopted by your Supreme Court in the case of *Staloch vs. Holm*, decided March 7, 1907, and reported in 100 Minn. 276, 111 N. W. 264:

"The surgeon does not deal with inanimate or insensate matter like the stone mason or bricklayer, who can choose his materials and adjust them according to mathematical lines, but he has a suffering human being to treat, a nervous system to tranquilize, and an excited will to regulate and control. Where a surgeon undertakes to treat a fractured limb, he has not only to apply the known facts and theoretical knowledge of his science, but he may have to contend with very many powerful and hidden influences, such as want of vital force, habit of life, hereditary disease, the state of the climate. These or the mental state of his patient may often render the management of a surgical case difficult, doubtful, and dangerous; and may have greater influence in the result than all the surgeon may be able to accomplish, even with the best skill and care."

The unjust rule of law which has just been mentioned and which permits an expert to condemn the

*An address delivered before the Economics Section of the Minnesota State Medical Association, April, 27, 1925.

treatment in question from the results alone, had its origin in your Supreme Court in the case of Sawyer vs. Berthold, decided January 12, 1912, and reported in 116 Minn. 551, 134 N. W. 120. That was a case in which the plaintiff sought to recover damages for alleged negligence on the part of the attending physician in the treatment of a Colles' fracture. Dr. Wilcox, an expert witness called by the plaintiff, testified in substance that such a deformity as was presented by the plaintiff following a fracture of the wrist such as plaintiff had sustained, would generally indicate improper treatment. However, he qualified this by the statement that there are some cases in which such a result could not be avoided. This was essentially all the expert testimony offered by the plaintiff in that case. The defendant objected to such testimony because Dr. Wilcox based his opinion of improper treatment upon the results alone. The court held this testimony was admissible and in so deciding used this language:

"It is undoubtedly correct that negligence of a physician or surgeon cannot be inferred from a poor result alone. There must be evidence from expert witnesses tending to show improper or unskillful treatment, in order to sustain a charge of malpractice against the physician. But this is not saying that an expert witness may not base his opinion that the treatment was improper wholly on the result, or that a court or jury cannot base its decision upon such an opinion."

Obviously the above rule of law as pronounced by your Supreme Court is not a mere inadvertence or error on the part of that dignified tribunal because the Supreme Court has reaffirmed this vicious and unjust rule of law which governs malpractice litigation in this state. In Viita vs. Dolan, decided January 21, 1916, reported in 132 Minn. 128, 155 N. W. 1077, the plaintiff sought to recover damages on account of alleged negligent treatment of a fracture of the leg between the knee and ankle. The result of the injury and treatment was an eversion of the foot. There the Supreme Court reaffirmed the doctrine of the Sawyer vs. Berthold case by using the following words, which are taken from the Viita decision:

"We need not repeat what was said in Sawyer vs. Berthold, 116 Minn. 441, 134 N. W. 120, to the effect that an expert witness may base his opinion on the results alone," etc.

Again we find this same doctrine appearing in the case of Holt vs. TenBroeck, decided November

24, 1916, 134 Minn. 458, 159 N. W. 1073, where the court says:

"A physician who qualified himself as an expert in the application of the X-ray was permitted to give his opinion, based upon the result of the operation, that the application was improper. This was not error. The ruling is in harmony with Sawyer vs. Berthold, 116 Minn. 441, 134 N. W. 120."

As late as 1917 this monster was not dead. We find it again raises its head to vex the defendant in the case of Peterson vs. Branton, decided May 25, 1917, reported in 137 Minn. 74, 162 N. W. 895. There the plaintiff sought to recover damages from Dr. Branton for alleged negligence in the treatment of a fractured arm. Dr. Johnson was called as an expert witness for the plaintiff. His testimony was:

"Taking into consideration the condition of the plaintiff's arm, he would say the treatment was improper."

The defendant objected to the testimony at the time it was offered, and set up the admission of the testimony as one of the grounds for reversal. When the case was brought before the Supreme Court, after a verdict and judgment had been rendered in favor of the plaintiff, the Supreme Court reaffirmed the rule of law as announced in the Sawyer vs. Berthold case and quotes the following from the Sawyer decision:

"In an action against a physician to recover damages for negligence or unskillful treatment of a patient, the result alone is not evidence of negligence; but an expert witness may give his opinion, based upon the result, that the treatment must have been improper, and such an opinion is evidence upon which the court or jury may find negligence."

As heretofore stated all malpractice law is derived from one of two sources. First, a legislative enactment or judicial decision. If a law is bad, vicious and unjust and there is a desire to change the law, the attention should be directed to the institution or department of government that has created and given birth to the obnoxious law. If the parent of the offspring cannot or will not reform the mischievous child, then that other source of law may be appealed to with expectation of certain relief.

2. Under the decisions of your Supreme Court an injured employee may receive compensation under the Workmen's Compensation Act for his entire disability, whether due to the original injury

or to an aggravation of the injury resulting from the negligence of the attending physician, and may thereafter maintain a malpractice action against the physician.

There is now pending in the District Court of Hennepin County a malpractice action in which the plaintiff is seeking to recover for the loss of a leg which he alleges in his complaint is due to the negligence of the defendant in the treatment of a certain injury that he had previously received. An investigation disclosed that the injury for which he was treated arose out of his employment and had occurred while he was in the course of his employment; that he had finally lost the leg by amputation. He applied for and was awarded compensation for the loss of his leg at the rate of \$16.80 per week for a period of two hundred weeks. After he was fully advised of all the consequences of his injuries, he then instituted this malpractice action to recover the same element of damages for which he had been awarded compensation.

There seems to be no question but what the intention of the Legislature when the Workmen's Compensation Act was passed and enacted into a law, was to simply create in favor of the injured employee a new remedy by which redress might be obtained. The injured employee under the Workmen's Compensation Act is able to recover the same elements of damage as he could under his old common law right of action. The amount of compensation may not be so great in some cases, but it is secured without delay and without great expense to the injured employee. The purpose of the Workmen's Compensation Act is stated in the title of the act itself as follows:

"An Act prescribing the liability of an employer to make compensation by way of damages for injuries due to accident received by an employee arising out of and in the course of employment, modifying common law and statutory remedies, in such cases; establishing an alternative elective schedule of compensation, regulating procedure for the determination of liability and compensation thereunder in certain cases, and prescribing penalties for the violation thereof."

Compensation is not in the nature of a charity, a pension or a gratuity, nor is it a penalty imposed upon the employer. This is well stated in the case of *State vs. Industrial Commission*, 92 Ohio St. 434, 111 N. W. 299, as follows:

"Again, this law was passed, not in a spirit of charity, but only simple justice. The fund it provides is called, and is in fact, an 'insurance' fund, from which payments are to be made, and is in no sense a pension fund, and never so far as we are aware has it been contended that injured employees and their dependents were not entitled to compensation as a matter of right. The right to be compensated for an injury has no element of bounty or charity about it. No part of the fund (except such part as it pays for the protection of its own employees) is contributed by the state."

And in *Brenner vs. Brenner*, 127 Md. 189, 96 Atl. 287, the court in its interpretation of the purposes of the Workmen's Compensation Act says:

"The object and purpose of such legislation has been two-fold: first, in cases of injury to employees to provide a speedy and inexpensive method by which compensation might be made to them or those dependent upon them without the delay of long and tedious litigation, and at a minimum of costs; and, secondly, to substitute a more uniform scale of compensation in cases of accident than could be obtained from the varying and often widely divergent estimates of juries, and also to avoid the application of certain well established rules of law, which in some cases have seemed to be harsh in their operation."

Wangler Boiler & Sheet Metal Works Co. vs. Industrial Comm. (Ill.), 122 N. E. 366:

"Compensation under the act in question (Workmen's Compensation Act) is analogous to and is to take the place of damages at common law and under the statute."

As a further exemplification of the purpose of the Workmen's Compensation Act we quote from *Stertz vs. Industrial Insurance Commission (Wash.)*, 158 Pac. 256, as follows:

"Our act came of a great compromise between employers and employed. Both had suffered under the old system; the employers by heavy judgments, of which half was opposing lawyers' booty, the workmen through the old defenses of exhaustion in wasteful litigation. Both wanted peace. The master, in exchange for limited liability, was willing to pay on some claims in future, where in the past there had been no liability at all. The servant was willing, not only to give up trial by jury, but to accept far less than he had often won in court; provided he was sure to get the small sum without having to fight for it."

Under his common law right of action before the passage of the Workmen's Compensation Acts, an injured employee could recover from his employer, if it were shown the injuries were due to the employer's negligence, not only damages for the original injury, but also damages on account of

negligence for malpractice, if any, of the attending physician.

In re Viou vs. Brooks-Scanlon Lumber Company, 99 Minn. 97, 108 N. W. 891, your Supreme Court with respect to the above proposition said:

"The mere fact that injuries caused by the negligence of the person sought to be charged have been increased by the negligence of an attending physician does not relieve that person of consequent liability."

And in *Field vs. Mankato Electric Traction Company*, 116 Minn. 218, 133 N. W. 577, on this same point your Supreme Court, speaking through Justice Simpson, said:

"Whether the physicians skillfully or unskillfully performed the necessary services, the plaintiff not being in fault in any matter, her impaired physical condition at the time of the trial followed in unbroken causal sequence the negligence of the defendant," etc.

So far as my own research has extended, no decision from your Supreme Court has been found decisive of the question as to the employer's liability, under the Workmen's Compensation Act, for an aggravation of an injury or an increased disability due to the negligence or mistake of the attending physician. However, in *Viita vs. Dolan, supra*, although that particular question was not before the court, yet the court took occasion to say:

"The employer, as we have seen, was not liable to the employee for the negligence of a physician. It was not required to compensate plaintiff for damages sustained by their malpractice," etc.

It may be enlightening and interesting to know what other courts have said on this particular point. In *Ross vs. Erickson Construction Company*, 89 Wash. 634, 155 Pac. 153, the court there said:

"The consequences of malpractice is an element which will be reconsidered by this state."

Pawlak vs. Hayes (Wis., 1916), 156 N. W. 464.

"The Compensation Act requires the employer to furnish a physician, and makes him liable for the value of the physician's services for not to exceed 90 days. * * * * This, we think, implies liability for any aggravation of the injury caused by the negligence of the physician treating the employee during such time."

The Supreme Court of Oklahoma was squarely faced with this very question in the case of *Cook vs. Booth Flinn, Ltd.*, 79 Okla. 280, 193 Pac. 36, and that court's answer was as follows:

"Under Workmen's Compensation Acts, an employer is liable for all the consequences following an accident, including unskillfulness or error of judgment of a physician furnished the injured employee as required by Section 4, of our Workmen's Compensation Act."

This question was again before the Supreme Court of Oklahoma in the case of *Brown vs. Sinclair Refining Company*, 206 Pac. 1042, where the rule of law as announced in *Cook vs. Booth Flinn, Ltd.*, was reaffirmed.

Where a person has been injured and makes a claim, under his common law right of action, and a settlement with the person whom he thinks has caused his injuries, and the settlement includes all injuries sustained whether due to the malpractice of the attending physician, according to the weight of authority and good reason, he cannot maintain an action against the attending physician to recover for damages on account of alleged malpractice.

As authority on this point, attention is called to *Hooyman vs. Reeve (Wisc.)*, 170 N. W. 282. In that case the plaintiff was employed by the Appleton Coated Paper Company and was injured under circumstances which caused him to think the Paper Company was responsible. After all his injuries were fully and completely known to him, he settled with the Paper Company for \$3,000, and stated in a release that the amount included all his injuries. He thereafter commenced this action to recover damages for alleged malpractice, which damages were necessarily included in the settlement with the Paper Company. When the question was properly brought before the Supreme Court of Wisconsin it decided that he could not maintain the malpractice action. In passing on the question that court said:

"The malpractice, if any, contributed to produce the injury settled for and satisfied by the master; hence such cause of action against the defendant was compensated for and extinguished by the settlement made. Clearly the settlement covered all damages sustained, including injury caused by the alleged malpractice."

This same question was before the Supreme Court of Washington in the case of *Martin vs. Cunningham*, 161 Pac. 355. In that case the plaintiff, at the time he received the injuries for which he was treated by the defendant, was employed as a fireman by the Great Northern Railway Company. In jumping from his engine to avoid a head-on collision he sustained a fracture of the tibia of the

left leg. After all consequences of his injuries were fully known to the plaintiff, he negotiated a settlement with the Great Northern Railway Company for \$8,000, and executed a release in which it was stated that the amount was for all damages that he had sustained or might thereafter sustain by reason of the alleged injury. He thereafter brought a malpractice action. The court held that same could not be maintained. In that decision the following language may be found:

"Conceding malpractice on respondent's part, as charged by the complaint, we think appellant is precluded from a recovery against him. The railway company was liable not only for the injury and resulting suffering of appellant, but also for the malpractice of the attending surgeon and for the expenses of medical attendance. Having that liability in view, the company settled with him, paying him a substantial sum for a release from further liability. At the date of the release the appellant had already suffered from the alleged malpractice and had employed another surgeon to remedy it, to whom he had paid \$500 for the service. These were all matters that could be enforced against the railway company under its liability for damages, and the settlement was clearly made with a view to covering all those elements of damages. They were known to exist by the parties to the release, and the settlement was made with reference to them. The release, having been made in full satisfaction of all existing claims, precludes the appellant from bringing a second action for malpractice against the surgeon, occupying somewhat the position for a joint tortfeasor, to recover double compensation for what he has already been satisfied."

Another case decisive of the question is *Guth vs. Vaughan*, 231 Ill. Ap. 143, where the court says:

"It follows, therefore, that when the plaintiff signed the document of July 13, 1918, in which he recited that he received \$225 from Florsheim which he acknowledged 'to be in full accord and satisfaction of a disputed claim growing out of bodily injuries' sustained by him on July 6, 1918, and by which document he further recited that he thereby released and forever discharged Florsheim 'from any and all actions, cause or causes of actions, claims and demands, for, upon, or by reason of any damage, loss, injury or suffering' which he had suffered or would suffer 'in consequence of such accidents and injury,' he must be considered, as a matter of 'equity and good conscience,' and, so, in the eyes of the law, as having received full satisfaction; and he will not be allowed to recover again for the same injury or its aggravation by malpractice."

From the above authorities and upon logic and principle it ought to be held by the courts that where an employee has been injured while in the

course of his employment, and has applied for and received compensation for all the disability that he has suffered, which in many cases must necessarily include a disability due to the aggravation of the original injury on account of error of judgment or mistake of the attending physician, the employee ought not therefore be permitted to have a double recovery in a malpractice action against the attending physician.

This question has been before the courts only on very few occasions. The Supreme Court of Washington had the question presented to it in the case of *Ross vs. Erickson Construction Company*, 155 Pac. 153. The plaintiff in that case had been injured in the course of his employment, had applied for and received his compensation and he thereafter sued his employer and the attending physician to recover damages for alleged malpractice of the attending physician in the treatment of the injuries that he had received in the course of his employment. The award and receipt of compensation was set up as a defense and the Supreme Court of Washington there held that it was a valid defense, inasmuch as the Compensation Act and the compensation for an injury received thereunder, included the very element of damages for which the plaintiff was seeking a recovery, and consequently the plaintiff's malpractice action could not be maintained.

The same question was presented to the Appellate Division of the Supreme Court of New York in the case of *Pitkin vs. Chapman*, 200 N. Y. S. 235. In that case the plaintiff had been injured in the course of his employment. He had applied for and received compensation in the amount of \$1,374.26. He thereafter instituted the malpractice proceedings against his attending physician. Compensation was set up as a defense. The court there held that it was a valid defense and a bar to the malpractice proceedings. We find this language in that decision:

"If a person injured employs, in good faith, a physician reputed competent, the original wrongdoer cannot escape entire liability, though the injuries are aggravated—or even though death results—because of mistakes in medical treatment. A wrongdoer cannot take advantage of the mistakes of a physician or surgeon in treating the injury. The mistake of the physician could not have occurred but for the original wrong. Therefore, he is not an intervening person responsible to the injured, if the injured seeks to hold only the original wrongdoer."

"This has been held so often in actions at common law that in such cases it is not an open question. The Workmen's Compensation Law does not alter this just and salutary principle. There can still be but one compensation for one wrong. That act provided a sure and certain compensation for a workman injured in the course of his employment. It did not provide or attempt to provide, in contravention of the common law, there could be two recoveries for what the common law had heretofore held to be one wrong—one injury."

Let us now see how the Supreme Court of Minnesota has answered this question. We have heretofore referred to the case of *Viita vs. Dolan*, decided January 21, 1916, and reported in 132 Minn. 128, 155 N. W. 464. In that case the plaintiff was injured in the course of his employment with the Johnson-Wentworth Company in skidding logs on February 5, 1914. His injury consisted of a fracture of the left leg between the knee and the ankle. He was thereafter treated by the defendants, Dr. Dolan and Dr. Fleming. On June 1, 1914, the plaintiff and his employer agreed upon a settlement for the injuries received by the plaintiff and petitioned the court for its approval under the terms of the Workmen's Compensation Act. The court approved of the settlement agreed upon, which contained the provision that when all payments thereunder had been made the employer was released from all claims on account of said injury under said act or otherwise. The above malpractice suit was thereafter instituted. The Supreme Court held that the employer, the Johnson-Wentworth Company, was not liable for any damages resulting from the malpractice of the attending physician. In the opinion the Supreme Court says that that element of damages was not included in the settlement, and consequently it was held that the settlement would not bar the malpractice action.

The question was again before the Supreme Court in the case of *Berkholz vs. Benepe*, decided November 3, 1922, and in that opinion we find this language:

"Plaintiff because of defendant's negligence was incapacitated for an additional period of six months. It is true, his hospital bills were paid, and the damages for loss of time were in a measure lessened to him because of the benefits of the Workmen's Compensation Act (Gen. St. 1913, Sec. 8195-8230); but the benefits so received do not go to mitigate or reduce the damages for additional lost time properly attributed to defendant's negligence. The benefits derived under the Compensation Act can well be placed, at least as to tort-feasors subsequent to the injury, in the same class as insurance carried by the injured party, which

has been held to not mitigate the damages for which the wrongdoer is liable."

You will note from the last quotation the tendency of the Supreme Court of Minnesota to hold that compensation received by an injured employee for injuries received while in the course of his employment under the Workmen's Compensation Act, is not a bar to a subsequent malpractice case where he seeks to recover the same element of damages as he has recovered by way of compensation. This ought to be changed, and to make such a defense available to a defendant in a malpractice case there necessarily should be an amendment to the Workmen's Compensation Act which will cure the defect. This should be carefully considered by the Legislative Committee of your organization.

3. A charitable hospital under the decisions of the Minnesota Supreme Court is liable to a patient for injuries that a patient may have sustained through negligence of an agent or employee of the charitable institution.

This doctrine contravenes the great weight of authority throughout the various states of the Union. The Supreme Court of Wisconsin, after it had reviewed the decisions varying on the question of liability of a charitable institution for negligence of an agent or servant, says:

"The authorities in this country almost uniformly hold that, in the absence of any negligence in their selection, charitable hospitals are not liable to their patients for the torts of their employees."

That language is found in the case of *Morrison vs. Henke*, decided by the Supreme Court of Wisconsin December 5, 1916, and reported in 160 N. W., page 173. In deciding the question of a charitable hospital's liability for injury to a patient through the negligence of an agent, nurse or employee, the court says:

"Since the hospital derives no profit from its work, and since it is founded for the sole purpose of conserving the health and life of all who may need its aid, and since it ministers to those who cannot pay as well as those who can, thus acting as a good Samaritan, justice and sound public policy alike dictate that it should be exempt from the liability attaching to masters whose only aim is to engage in enterprises of profit or of self-interest. The patient who accepts the services of such an institution, if injured therein by the negligence of an employee, must be content to look for redress to such employee alone."

We have now seen what the Supreme Court of the sister state on the east has said concerning this

question; now let us look to the Supreme Court of the state to the south, namely, Iowa. In the case of *Mikota vs. Sisters of Mercy*, decided by the Supreme Court of Iowa, June 27, 1918, and reported in 168 N. W., page 219, that tribunal says:

"We think the great weight of authority is to the effect that an institution of this kind is exempted from liability to one who comes to it and accepts the benefits of its charity, to a patient received for treatment, so far as liability is predicated on the negligence of its servants in administering the charity."

The Supreme Court of Iowa has decided this question in accordance with what it has found to be the weight of authority.

The question was presented to the Supreme Court of Minnesota in the case of *Mulliner vs. Evangelical Deaconess Hospital*, which was decided by that court January 9, 1920, 175 N. W. 699. The court finds that the defendant institution is a charitable hospital. It is stated in that opinion that this is the first time that the question was ever squarely presented to the court and that the court is free to decide the question either in favor or against the hospital. The court finds that the great weight of authority exempts the hospital from liability, but the court says:

"The precise question is not foreclosed by decisions of this court. We are free to adopt the rule which seems to us the more just."

The court then holds that a charitable hospital is liable for the injuries of a patient occasioned through the negligence of a nurse or agent the same as any other corporation that is maintained for profit and in so holding the court has used this language:

"This corporation must administer its functions through agents as any other corporation does. It harms and benefits third parties exactly as they are harmed or benefited by others. To the person injured the loss is the same as though the injury had been sustained

in a private hospital for gain. In this case, the deceased paid for the services he expected would be rendered, but this may not be a controlling fact. We do not believe that a policy of irresponsibility best subserves the beneficent purposes for which the hospital is maintained. We do not approve the public policy, which would require the widow and children of deceased rather than the corporation, to suffer the loss incurred through the fault of the corporation's employees, or, in other words, which would compel the persons damaged to contribute the amount of their loss to the purposes of even the most worthy corporation. We are of the opinion that public policy does not favor exemption from liability."

This decision, as has been intimated, is contrary to the decisions of courts of other states. Rhode Island and Alabama are the only exceptions to this rule. The Rhode Island Supreme Court rendered its decision in the case of *Glavin vs. Rhode Island*, 12 R. I. 411. At the very next session of the legislature following the Glavin decision the legislature passed a law completely and entirely abrogating the force of that decision. The law as enacted and which now stands as the law of Rhode Island, is as follows:

"No hospital incorporated by the General Assembly of this State, sustained in whole or in part by charitable contributions or endowments, shall be liable for the negligence, carelessness or want of skill, or for the malicious acts of any of its officers, agents or employees in the management of, or for the care or treatment of any of the patients or inmates of such hospital."

This law may be found in the General Laws of Rhode Island, 1896, page 538.

In view of the interests of medical men in the maintenance of hospitals, and particularly charitable hospitals, and in view of the interests of the officers of the charitable hospitals of this state, steps ought to be taken to do what was done in Rhode Island, namely, the passage of a legislative act abolishing, abrogating and making null and void the force and importance of the decision in the *Mulliner vs. Evangelical Hospital* case.

THE AMERICAN ASSOCIATION FOR MEDICAL PROGRESS*

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In 1923 a group of American citizens cognizant of the fact that the medical profession has contributed much of value to humanity, and also cognizant of the fact that the widespread propaganda against the medical sciences and closely allied sciences seriously threatens the future welfare of humanity, effected an organization known as The Friends of Medical Progress. This organization, effected in Boston, was a Lay Society with the following objects:

1. To encourage and aid all research and humane experimentation for the advancement of medical science;
2. To inform the public of the truth concerning the value of scientific medicine to humanity and to animals;
3. To resist the efforts of the ignorant or fanatical persons or societies constantly urging legislation dangerous to the health and well-being of the American people.

Among the officers of this society were Charles W. Eliot, President Emeritus of Harvard University; Charles Evans Hughes, Chief Justice of the United States; Dr. Ellen F. Pendleton, President of Wellesley College; and Dr. James Angell, President of Yale University. The work of this organization progressed splendidly and later its name was changed to the American Association for Medical Progress. The permanent headquarters of this Association are 370 Seventh Ave., New York City. It already enjoys a membership of more than 2,000, consisting of prominent business men, non-medical scientists of repute, college and university professors, college and university presidents, etc.

The American Association for Medical Progress has called attention to the fact that an "Anti-medical campaign is being conducted by a considerable number of organizations professing various aims, such as Anti-vivisection, Anti-vaccination and Medical liberty, but all seeking by fair means or foul to bring into disrepute scientific methods of combating disease and to substitute therefor every

known form of pseudo-science and quackery." They have pointed out further that "all these societies base their claims to support on propositions which are wholly or largely false. The anti-vivisectionists for instance tell us that they exist for the purpose of saving animals from unspeakable and ruthless torture at the hands of heartless doctors who conduct experiments which never have been, and which never can be, of any benefit. As a matter of fact, the anti-vivisectionists might disband tomorrow and not a single animal on this earth would miss them, for complete investigation shows that no animals are ruthlessly tortured in the laboratories. Whatever reason there may have been for the existence of such societies before the discovery of anesthetics, today their status is that of a public nuisance and a serious menace to society."

Four times within the last three years—twice in California, once in Colorado and once in Minnesota—determined efforts have been made by these people to secure legislation providing for the total abolition of animal experimentation in the states mentioned. "After long and bitter fights, with the expenditure of much time and effort, the dangerous bills were defeated. Had they been passed, the seriousness of the situation can hardly be exaggerated. If in any state such a bill should become a law, every research laboratory would be closed, bringing to an end all the investigations looking to the cure of cancer, infantile paralysis, influenza, scarlet fever, whooping cough, and many other diseases. No smallpox vaccine could be made in that state, and unless fresh vaccine could be brought in from outside, first the children, and eventually the whole population, would be exposed to one of the most terrifying and deadly scourges known to man. If there were an outbreak of diphtheria in that state thousands of children would die as they used to die before the days of antitoxin, unless relief came from some other state where no such law was in force. The outlook for farm animals would be just as bad. If there were an epidemic of hog cholera, it would be impossible to check it unless hog cholera serum, the only known preventive, could be procured outside the limits of the state. In short, not only would medical progress be completely halted, but the hands of the physicians and veterinarians and boards of health would be tied, and in default of outside assistance many diseases would run their fatal

*Read before the Minnesota State Medical Association, April 27, 1925, Minneapolis.

courses unchecked, as they did in the middle ages.

Nor would the trouble end here. The success of anti-vivisection societies in one state would be used as a lever by similar societies in other states, and the medical profession might soon be crippled over a wide area, greatly lessening the chances of obtaining outside help. English physicians are already seriously hampered in their work and the recent outbreaks of smallpox in England have given stern warning of the folly of listening to fanatics. It was more than a coincidence that the most serious outbreak occurred in Gloucester, the home of the President of the British Union for the Abolition of Vivisection, where presumably his influence was the greatest."

It may seem that such conditions as prevail in England do not concern us, but the following statement quoted from a letter recently received from Dr. A. K. Fisher, in charge of Economic Investigations, U. S. Department of Agriculture, gives us a hint which we should not neglect. Dr. Fisher is an able scientist and very conservative. He says:

"During a western trip which I have just completed, in conversation with an eminent physician he informed me that, in his opinion, within the next ten or fifteen years there would be a fearful epidemic of smallpox spread over the country vastly more serious in mortality than the epidemic of influenza of 1918. The reason for this is that many municipal officers are listening to the maudlin sentiment of those opposed to animal experimentation and the use of antitoxins. Through their activities we may expect the death of many thousand innocent children."

The anti-vivisectionists have already seriously checked the progress of veterinary medicine in this country. "In 1914, when Mr. Rockefeller gave \$1,000,000 to establish in New Jersey a laboratory for the study of animal diseases, the anti-vivisectionists persuaded the Governor to veto the bill authorizing this humane work."

I believe all present will agree that the medical profession is not in a position to combat these unscrupulous individuals and organizations because the members of the medical profession are too busy fighting disease and conserving the health of the public. Another reason is clearly expressed in the following quotation:

"Granted, then, that a widespread educational program is necessary, why is it the part of the layman to see that it is undertaken? Why is this

not the business of the doctors themselves? The answer to this question can be found in past experience. Occasionally in the past public-spirited scientists and physicians have come forward and attempted to tell the public something of what scientific medicine was doing. As a result, they have been accused of 'lining their own pockets,' of trying to 'sell' their profession to the public, of having a selfish interest in the public-health measures they were forwarding. To the man who knows, such accusations carry no weight, but the average citizen does not know the actual conditions. He becomes suspicious of doctors testifying in their own behalf. But no suspicion attaches to the testimony of a society of laymen who have no possible axes to grind." Therefore, this work of encouraging the research worker, of informing the public of the truth concerning the value of scientific medicine, and of combating the efforts of ignorant and fanatical persons or societies urging legislation dangerous to the health and well-being of the human race can best be done by non-medical people knowing and teaching the truth. The American Association for Medical Progress is composed of just such a group. Already they have done much valuable work. With the close of the year 1924 they had published and distributed approximately 72,000 pamphlets on such subjects as:

How vivisection abolished yellow fever.
Vivisection and modern miracles.
Vivisection and animal welfare.
How Pasteur convinced the world.
Your child's life or the dumb animals?
Save your child from diphtheria.
Smallpox.

All of these pamphlets are not only interesting and instructive, but also are authoritatively prepared.

In addition to this splendid work the members of the American Association for Medical Progress have entered into legislative activity. They have laid plans for the hearings on bills dealing with anti-vivisection and anti-vaccination before state legislatures and have been successful in having these bills defeated.

The good work which the members of the American Association for Medical Progress are doing is becoming widely recognized by the medical profession. For example, the Manchester Medical Association and the American Surgical Association voted that every member of their organizations be

assessed \$1 for membership in the Friends of Medical Progress. Then the American Medical Association, the Association of American Medical Colleges, the Ohio State Medical Association, the University of Cincinnati School of Medicine, the University of California School of Medicine and many other medical organizations have done much to aid and encourage the American Association for Medical Progress.

Obviously such an association would be in great need of an Advisory Medical Board. Nothing need be said further about the reliability of the information furnished this Association when one knows that the following physicians constitute the Medical Advisory Board:

W. W. Keen, Chairman; Charles C. Bass, Montrose T. Burrows, Walter B. Cannon, Charles P. Emerson, Simon Flexner, Wilfred T. Grenfell, William J. Mayo, George W. McCoy, Henry Sewell, H. Gideon Wells, George H. Whipple, David Stuart White and Ray Lyman Wilbur.

The possibilities of the American Association for Medical Progress for doing good were early recognized by the citizens of many states and municipalities, who requested that branch associations be organized. Already several such branches are

in existence. It is hoped that before long branches will be organized in the larger cities of Minnesota and that ultimately we may be able to effect a state organization working in close co-operation with the national Association. Such an organization would be capable of doing much to promote advancement of medical and closely allied sciences, to inform and keep informed the public concerning the high value of scientific medicine to humanity, and to advance through legislation those measures destined to add to the health and well-being of the American people. Until such branch organizations are made possible in our cities and state the National Association will do all in its power to help us. Therefore, I believe every physician in our state should lend his support to the development of a Minnesota Society for Medical Progress, to be composed largely of laymen and controlled entirely by laymen. Such a society would not only get the co-operation of the American Association for Medical Progress, and through it of similar groups in other states, but also would do its share toward making America safe for science and intelligence. Moreover, it would aid materially in many instances in the substitution of happiness for sorrow in the greatest of all American institutions—the home.

BENZYL-VIBURNUM COMPOUND NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Benzyl-Viburnum Compound (Benzyl-Viburnum Laboratory, Washington, D. C.) is marketed in the form of capsules. Each capsule is stated to contain 2 grains of benzyl succinate, viburnum opulus and helonin and powdered ginger root. The name "helonin" has been applied to an extractive preparation derived from false unicorn (*Helonias dioica*) of indefinite composition. Benzyl-Viburnum Compound is proposed for the treatment of dysmenorrhea and "true asthma." Benzyl esters have been found to be without value in asthma. Cramp bark (*Viburnum opulus*) and false unicorn (*Helonias dioica*) have long been constituents of proprietary "female" remedies, but there is no evidence of their efficiency. The trade package contains recommendations for the use of the preparation in painful menstruation and the advertising suggests that the bottle of the capsules may be carried in the shopping bag. The Council concludes that Benzyl-Viburnum Compound is an indefinite complex and irrational mixture, which is marketed with unwarranted therapeutic claims and in a way to encourage its indiscriminate and harmful use by the public.

(*Jour. A. M. A.*, Aug. 22, 1925, p. 628.)

LONG ISLAND JOURNAL ADOPTS COUNCIL STANDARDS

Slowly but surely the work of the Council on Pharmacy and Chemistry is receiving recognition. The resolution endorsing the Council's work signed by every member of the house of delegates at the 1916 session is only the official record of the increasing support and encouragement being given by individual members of the profession. Practically every medical journal of standing refuses today to accept advertisements of pharmaceutic preparations that have not met the Council's requirement. This standard has been adopted by all of the official organs of the various state medical associations (with the notable exception of the Illinois Medical Journal). The difficulty of financing a strictly professional journal is no doubt in a great measure responsible for the failure of some publications to close their advertising columns to any but Council accepted pharmaceutic products. That the best of these journals desire to support the Council is shown by a letter from the business manager of the Long Island Medical Journal announcing the arrival of the hopefully anticipated time when this publication can afford to solicit advertising only from manufacturers of products that meet the Council's requirements. Henceforth, only such pharmaceutic products as are accepted for inclusion in New and Non-official Remedies will be advertised in the Long Island publication.

(*Jour. A. M. A.*, Aug. 29, 1925, p. 681.)

BONE TUMORS*

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The recognition of the presence of a lesion of the bone immediately raises the question of benignancy or malignancy. Further, the exclusion of inflammatory lesions which may simulate tumor and the differentiation of the local and general skeletal involvement, metastasis and location of primary tumors, presents interesting problems. While the experienced roentgenologist may correctly diagnose the majority of bone tumors, there are certain of such tumors that defy recognition, and careful history taking, clinical and laboratory examinations, and even surgical explorations, are necessary to determine their true nature. The age, sex, trauma history, origin, site, size in, or invasion through, osseous and periosseous tissues, osteoclastic and osteoblastic character of, and condition of the cancellous bone cortex and periosteum, are all factors worthy of consideration in determining diagnosis, prognosis and treatment. The operability of the tumor is dependent on its local or general character; whether benign or malignant it may be of a type, size, or situation that will prevent surgical relief. The use of radium and x-ray has become valuable in the treatment of certain types of tumors, independently, in combination, or preoperatively and postoperatively. The roentgenographic examination of the chest is especially important in cases of malignant tumors, as it gives the earliest evidence of metastasis to the lung, a procedure which should be a routine before operation even in suspected cases.

The nomenclature of tumors of the bone has been confused by physician, surgeon, and pathologist, so that it has been difficult at times to understand clearly the exact meaning of myeloma, giant-cell sarcoma, giant-cell tumor, and so forth. To divide the osseous tumors into benign and malignant groups, with possibly a borderline group of inflammatory origin, would seem feasible. The term sarcoma should be confined to malignant tumors; thus, giant-cell tumors denoting the group of tumors more commonly regarded by surgeons and pathologists as benign, but formerly called

giant-cell sarcoma. The terms, central sarcoma and periosteal sarcoma, have been in common use, but the terms should be descriptive only.

The illustrative cases presented and discussed briefly here are as follows: benign cases, exostosis, chondroma, osteitis fibrosa cystica, and giant-cell tumor; and malignant cases, sarcoma, endothelioma, and multiple myelomas.

CASE 1. *Exostosis of the femur.*—A housewife, aged twenty-one, came for consultation February 15, 1916, because of the presence for ten years of a tumor on the inner side of the right femur just above the knee-joint. The tumor had caused little or no pain, unless it was injured. It had increased slowly in size until it interfered with walking; the leg tired easily. There has been a gain in weight.

Examination disclosed a large, bony mass, on the inner aspect of the right femur, apparently arising from the lower end of the diaphysis. There was no particular tenderness,



Fig. 1. Exostosis of the femur.

nor were the superficial veins engorged. There was no atrophy in the leg, but it was 7.5 cm. larger in circumference than the left leg. There was slight tenderness over the left sacro-iliac joint. The tonsils were enlarged, but not definitely infected. Examination of the blood, the urinalysis, and other findings were negative. The x-ray diagnosis was a large exostosis on the inner aspect of the right femur (Fig. 1).

The patient was operated on February 17. The exostosis was chiseled off, the base cauterized, and a rubber tissue drain inserted. She was dismissed from the hospital on the seventh day.

The patient returned to the clinic with another complaint in 1919. She was examined and there was no evidence of recurrence of the growth, and she had had no further difficulty since.

Comment.—These circumscribed, irregular tumors present a great variety of shapes; they arise from wide or

*Read before the Minnesota State Medical Association, Minneapolis, April 28, 1925.

pedunculated bases from the surface of the bone; their cancellous structure may extend into that of the bone itself and present varied amounts of cartilage over the surface, giving rise, as in this case, to a somewhat cauliflower-like growth. They may result from trauma, or inflammation; they may be multiple or symmetric; they are sometimes hereditary. In the symmetric types deformity of the extremities may result from disturbances of growth. The tumors usually arise near the ends of the long bones, although the scapula, spine, and skull may be affected. They occur in the young, usually grow slowly, although there may be rapid growth following injury. An overlying bursa, if irritated, may enlarge suddenly, and a diagnosis of sarcoma is sometimes erroneously made in such cases. If the tumors do not inconvenience the patient from pressure, or limitation of motion, surgery may be deferred. In this case ten years had elapsed since onset, then mechanical difficulties arose sufficient to warrant removal of the tumor. Roentgenograms disclosed a pedunculated tumor, penetrated by a bulbous, cauliflower-like head into the

ment of the periosteum or perforation into the soft tissues, apparently a multilocular trabeculated cystic area (Fig. 2). A tumor, cyst or Brodie's abscess was diagnosed, and exploration under tourniquet advised.

At operation, a multiple lobulated cartilaginous mass was found to involve the condyles. There was also a cystic cavity 2.5 cm. in diameter. The diseased area was curetted thoroughly. The pathologist's diagnosis was chondroma. The patient was dismissed on the twelfth day following operation.

The patient returned about two years later. For about a year he had been completely relieved. There was now pain over the inner side of the right knee, similar to that before operation, which troubled him only at night.

Examination did not reveal swelling or limitation of motion. A small bony mass could be felt in the scar 7.5 cm. above the condyle, and there was local tenderness. The urine and blood were normal. Roentgenograms disclosed a small cystic area in the internal condyle, and a strip of periosteum that apparently resulted in a small exostosis. Roentgenograms of the chest were negative.

February 4, 1922, an incision was made through the old scar, and a small exostosis removed and the area of previous operation explored. A small area, 1.25 cm. in diameter, containing cartilage, was found. The remaining area, which had occupied a large portion of the condyle, had filled in with new bone. The patient was dismissed on the sixth day. There has been no recurrence.

Comment.—Chondroma of this type is usually composed of hyaline cartilage supported on a fine framework of connective tissue. It is avascular, may contain irregular bony deposits, and is single or multiple. It is supposed to arise as a result of rickets, trauma, displaced embryonal rests, syphilis, or a transition of connective tissue cells. The symptoms vary according to the situation, size, and the condition of the substance of the tumor. It is likely to degenerate in the later stages, and not infrequently, if large, is covered by a superimposed bursa. Aching pain and occasionally tenderness are complained of, especially if pressure is made on nerves and blood vessels. Fracture may occur. Local heat in the area of the tumor is rare, and there is usually an absence of venous engorgement, which so commonly occurs with malignant tumors. Pulsation is absent. Roentgenograms do not always show characteristic findings, and the lesion may simulate fibrocystic disease or giant-cell tumor, or, more rarely, malignant bone tumor following infection. While the roentgenogram does not always determine the diagnosis, it establishes the site and extent, and differentiates the single and multiple types.

I have previously reported² the case of a patient, aged fifty-three, who had a tumor in a similar location, in which a diagnosis of sarcoma had been made from the roentgenogram, and amputation of the hip-joint advised. This patient was treated by exploration and curettage in August, 1916, and is still walking on the leg without definite evidence of further trouble, almost nine years after operation. This patient's symptoms antedated operation by seven years, which gives an idea of the slow growth of these tumors at times. The local symptoms in this case were rheumatism and lameness in the left knee, without



Fig. 2. Chondroma and cyst in the condyles of the femur.

periosteal tissues, the mottled appearance being due to irregular growth and cartilage.

CASE 2. Chondroma of the femur.—A farmer, aged thirty-two, came to the clinic in February, 1918, complaining of a dull pain in the right knee and occasionally in the left, for the last two years. He had continued work up to the time of examination, and thought his condition was probably due to rheumatism.

Examination revealed slight tenderness over the inner side of the right knee, and slight limitation of flexion. There was slight tenderness on firm pressure over the internal condyle. The tonsils were enlarged and septic; the urinalysis and the Wassermann reaction were negative; the hemoglobin was 80 per cent. Roentgenograms showed cystic areas in the epiphysis of the femur, without involve-

limitation of motion, deformity or tenderness. Thorough removal of the tumor whenever possible should be sufficient.

CASE 3. *Osteitis fibrosa cystica of the humerus.*—A boy, aged twelve, came to the clinic for examination in July, 1919, because of aching pain and swelling in the upper third of the left humerus. The arm had been severely injured eight years before, possibly fractured. Two months

osteum, appear to be a radical form of treatment in localized forms. Watchful waiting frequently requires splinting and prolonged observation, without the certainty of diagnosing the true character of the tumor. It involves an economic problem, as well as anxiety on the part of the patient and relatives. The period of hospitalization in this case was five days, the patient returning home on the fourteenth day.

CASE 4. *Giant-cell tumor of the femur.*—The patient, a domestic, aged twenty-two, came for consultation October 6, 1917, complaining of stiffness in the left knee. Five months previously, she had noticed soreness, then stiffness in the left knee. A diagnosis of sarcoma had been made, and she had received some form of injection treatment. The tumor continued to enlarge and disability increased.

Examination showed that the patient was 5 pounds underweight. The systolic blood pressure was 130, the diastolic 80, and the pulse rate 69. The Wassermann reaction, urinalysis, and roentgenograms of the chest were negative. A diagnosis of sarcoma was made from the roentgenogram of the leg (Fig. 4). The clinical diagnosis was sarcoma. The surgeon's diagnosis was tumor, and he advised exploration, excision of the tumor, and radium.

Operation was performed October 8, and a specimen of tissue was diagnosed giant-cell tumor. The tumor had invaded the inner condyle and extended to the shaft. The tissue was reddish and jam-like. The tissue was thoroughly curetted out, the actual cautery used, and a gauze pack and rubber tissue drain inserted. Fifty milligrams of radium was left in the wound for twenty-four hours.

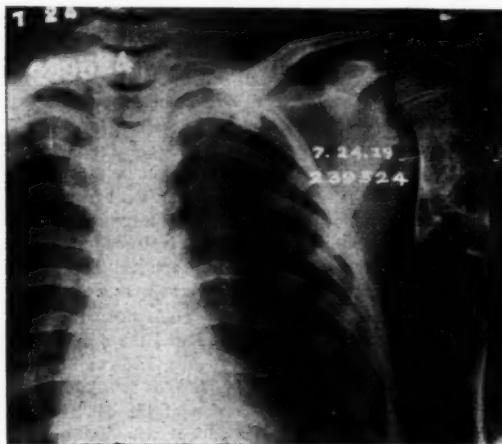


Fig. 3. *Osteitis fibrosa cystica of the humerus.*

before examination, it had been traumatized. The arm was freely movable, and without pain or tenderness; a thickening of the upper third of the humerus was apparent. The parents and the child were greatly alarmed because cancer of the bone had been diagnosed and a Berger amputation of the shoulder advised.

A diagnosis of fibrocystic disease was made from the clinical and roentgenographic evidence, and a conservative operation advised (Fig. 3). The thin shell of cortex was broken through and a specimen removed which verified the diagnosis; following this the wound was thoroughly curetted and closed without drainage. The pathologist diagnosed *osteitis fibrosa cystica*. Subsequent roentgenograms showed a rapid filling in of the curetted area by new bone, so that the function shortly after operation returned to normal. The patient is living and well, with perfect use of the arm practically seven years after operation.

Comment.—These cysts usually occur in the young; they grow slowly and cause enlargement and softening of bone of the femur, humerus, tibia, and the proximal ends of the diaphysis. Roentgenograms are fairly characteristic, and in most cases diagnostic. The tumors rarely involve the epiphysis; they expand the cortex and periosteum and are trabeculated. Pain is rheumatic in character. Symptoms may be ushered in by fracture. The etiology is unknown, although infection and trauma are considered. The disease may occur in local and general forms, and therefore roentgenograms of the long bones should be made to exclude this type. Thorough curettage and crushing in of a portion of the thin wall, and resuturing the peri-



Fig. 4. *Giant-cell tumor of the femur.*

November 2, the patient was given 50 mg. of radium for fifteen hours, making a total of 1,750 mg. hours. The patient was dismissed on the twenty-sixth day. She continues in good health, and there has been no recurrence of the tumor. She has married, and has a family.

Comment.—This case illustrates the value of exploration under tourniquet and the opinion of a competent pathologist before subjecting the patient to amputation. The roentgenogram and clinical diagnosis of sarcoma, would, of course, have given a hopeless prognosis following a palliative amputation. The history of symptoms was short, and the growth somewhat rapid; it is very doubtful whether this tumor could have been diagnosed from the roentgenogram, or clinical findings alone. Treatment by roentgen ray might have relieved the condition, although the period of disability, twenty-six days, and the complete recovery would indicate that surgery was the rational treatment. Without exploration and operation, a positive diagnosis and prognosis could not have been made.

I have previously reported^{4,5} the roentgen-ray findings in a series of twenty-four cases of benign tumors of the bone, in which operation was performed and specimens studied. The patients have remained well for from two to fifteen years after operation, without evidence of metastasis. The average duration of the tumor before operation had been twenty months.

The treatment in such cases should be as conservative as possible, the ultimate function and economic condition of the patient being duly considered. Some of these tumors are so large and so close to weight-bearing joints that conservative surgery or treatment by roentgen ray is contraindicated; the uncertainty of the result, the disability, pain and the economic condition of the patient, may warrant amputation and the use of an artificial limb. This should, however, not be misconstrued to mean that all tumors around large joints should be amputated, but only when extreme destruction has taken place. The prognosis is good as regards life. These tumors may possibly be inflammatory in origin. They grow slowly, and cause few clinical symptoms. They have been described as a result of low grade inflammatory processes and trauma. The descriptive term "benign foreign-body giant-cell tumor" should be applied to these lesions.

In another case, described elsewhere,⁷ a patient was operated on for a giant-cell tumor of the femur, which had been diagnosed elsewhere as sarcoma. It recurred, and was again diagnosed elsewhere as sarcoma. The patient returned and was operated on the second time, nine months after the first operation, and radium applied. Tissue removed at both operations failed to show malignancy. The patient has now been well approximately three years without evidence of further recurrence.

CASE 5. Osteogenic sarcoma of the tibia.—A schoolgirl, aged thirteen, was brought to the clinic June 11, 1923, because of painless swelling of the left tibia. She had been injured twelve months, and nine months before in the region of the growth. Swelling was noticed immediately after the second injury, and this had increased.

The examination was entirely negative, with the exception of a tumor that was firm and fixed to the lower half of the tibia. The roentgen-ray, clinical and surgical diagnoses were sarcoma of the left tibia (Fig. 5).

June 15, 1923, amputation was performed through the lower third of the left femur. Roentgen-ray treatment was advised. The pathologist reported subperiosteal osteochondrosarcoma. The subsequent history was uneventful, and

the stump healed by primary intention. Roentgen-ray treatment is being carried out, while the patient walks with an artificial limb.

Comment.—That amputation may successfully remove the local condition has been demonstrated; metastasis must be prevented or cure cannot be expected. The x-ray gives the earliest evidence of metastasis to the lung, and may eventually be instrumental in its prevention, or the cure of metastatic growths. Medication thus far has failed to influence results, although toxins have been reported of benefit. The five-year cures in cases of carcinoma and epithelioma increased greatly as a result of publicity leading to early diagnosis, radical surgery, and postoperative and preoperative therapeutic measures. Future efforts



Fig. 5. Sarcoma of the tibia.

along these lines may give equally good results in cases of sarcoma of the bones.

Of a series of 470 cases of sarcoma of the extremities examined at the Mayo Clinic 35 per cent were of the bone. The most common sites are in the lower end of the femur, upper end of the tibia, and upper end of the humerus. Trauma to the site of the lesion is given as an etiologic factor in more than 50 per cent of the cases in the clinic. Seventy-eight per cent occurred in the long bones at the knee. The ages of 75 per cent of the patients were between ten and forty years. Dull pain, tumor of slow or rapid growth, and varying in tenderness, are common early symptoms. Later, there are superficial venous enlargement, local heat, discoloration, joint stiffness, and pathologic fracture,

anemia, loss of weight, disability, and finally cough, which is always suggestive of metastasis. I have previously discussed the distribution, relation of trauma to type of cell found, relation of cell to age, relation of age to location, relation of type of cell to duration of symptoms before and after operation with life expectancy and end results in 109 cases, and, also, the value of the x-ray in diagnosis and the types roentgenographically met with in a series of several hundred sarcomas.

This child is up and around apparently well and happy almost two years after amputation. An attempt to control the tumor in this case by less radical measures would not have been reasonable. Osteogenic sarcomas are very malignant; they produce metastasis, and the prognosis is always grave. I have eradicated the local growth and attempted to control metastasis through radiotherapy.

CASE 6. Endothelioma of humerus.—The patient, a university student, aged twenty-three, came to the clinic November 1, 1920, because of painful swelling in the right shoulder. He had injured the shoulder in November, 1918, and again in March, 1920, eight months before his examination here. Following the second injury, the shoulder remained painful and slightly stiff, and following x-ray examination treatment had been given for impacted fracture. The presence of a tumor, probably sarcoma, was suspected, and operation advised. There had been several consultations with regard to the advisability of amputation.

The right shoulder in the upper third was found to be enlarged, due to a tumorous growth which was fairly firm and apparently arising from the humerus. There was limitation of motion and of function of the shoulder and arm. The roentgenologic diagnosis was sarcoma of the humerus (Fig. 6). Roentgenograms of the chest were negative for metastasis. A four-quarter amputation was advised and agreed to by the patient.

December 3, 1920, the soft, vascular tumor was explored and curetted out. The pathologist reported round-cell sarcoma. It was believed advisable to attempt to save the extremity inasmuch as round-cell sarcomas are more amenable to radiotherapy. The tumor was removed as completely as possible, and the wound packed with gauze. Radium was used in the wound as the pack was removed, and in the skin over the tumor area, while x-rays were applied over the chest by the cross-fire method. The patient cooperated well and returned at regular intervals for observation. A discharging sinus persisted. He gained weight rapidly. A dermatitis developed about the wound, the result of the irritating discharge and radiation; this, however, was not serious.

August 22, 1922, a sequestrum was removed from the right humerus. May 15, 1923, a pathologic fracture occurred, and tissue removed at this time was reported to be mixed-cell sarcoma. August 22, nonunion persisting, a disarticulation was performed at the shoulder, with complete removal of the deltoid muscle. The humeral head and the deltoid muscle at its origin were involved. The pathologist reported mixed-cell sarcoma of peripheral arrangement. The total amount of radium used in this case was 58,716 mg. hours, from December, 1920, to May, 1922. Roentgenograms of the chest were negative. The patient has remained well, has gained in weight, and is attending college.

Comment.—This university student, with a definite history of injury and fracture, had been observed by an excellent surgeon, who suspected sarcoma. Even though amputation had been advised, it seemed desirable to attempt to save the arm, especially as round-celled sarcomas, which have been described as endotheliomas, appear to react more favorably to radium and x-ray treatment than osteogenic sarcomas. There was a temporary beneficial reaction to



Fig. 6. Endothelioma of the humerus.

radiotherapy; however, amputation proved the presence of malignant bone and muscle. These endotheliomas appear to be osteoclastic. They spread over the shaft of the long bones to a considerable extent, and produce bulging and striations. They may be single or multiple, and may simulate metastatic carcinoma of the breast, and multiple myelomas. They are more likely to involve the shaft rather than the ends of the bones, as is the case in sarcoma, and the outlines are less sharply defined in the areas of bone destruction than in the osteoclastic forms of sarcoma, as observed roentgenographically. They tend to metastasize and are usually fatal.

CASE 7. Multiple myelomas.—A man, aged fifty-five, came to the clinic October 20, 1922, complaining of double vision. Four months before, he had noticed a small lump on the top of his head, which slowly increased in size. Two weeks before, he suddenly had double vision, and complained of neurotic pains in the arms and chest. His general health otherwise was good. He thought that an abscessed tooth which had been removed about two months before was responsible for the pain.

Examination disclosed a soft tumor on the left posterior parietal region, the edge of the bone being plainly palpable. Examination of the eyes revealed vision, right 6/30, left 6/30, with correction 6/5, reflexes normal, fundi normal and fields normal. The x-ray showed an area of destruction in the left parietal, frontal, and occipital bones (Fig. 7). The right clavicle, right second rib and left first rib were apparently involved. There was no evi-

dence of spinal or pelvic involvement. Roentgenograms of the lungs were negative. There was pain, however, and tenderness over the left lower ribs posteriorly. Two samples of urine showed a specific gravity of 1.027 and 1.034. The reaction was acid, there was considerable albumin and an occasional hyalin cast, and the Bence-Jones test was negative on both occasions. The hemoglobin was 75 per cent; the Wassermann test was negative.



Fig. 7. Multiple myelomas of the skull.

A diagnosis of multiple myeloma was made and the patient was referred home with an unfavorable prognosis, where he died May 17, 1923. Necropsy disclosed multiple myelomas involving the skull, ribs, and right clavicle. There was marked emaciation, arteriosclerosis, hypostatic edema and congestion of the lungs, and old healed tuberculous pleurisy and lymphadenitis.

ANOTHER MAIL-ORDER REJUVENATING CONCERN DECLARED A FRAUD

For two or three years past a mail-order concern calling itself the "Melton Laboratories, Manufacturing Chemists," has been defrauding the public from Kansas City, Mo., in the sale of an alleged sex rejuvenator. The "Melton Laboratories" were not laboratories, and the "manufacturing chemists" were neither chemists nor manufacturers. The thing was a crude mail-order swindle operated chiefly by Harold Nelson Stunz. The nostrum put out by the Melton Laboratories was called "Korex." Later, Stunz had two

Comment.—Multiple myelomas rarely occur. They are characterized by multiple tumors of the bone marrow and are more common in males than in females. Patients are usually from forty to sixty years of age. The roentgenogram may show one or many rarefied circular or ovoid osteoclastic areas in the soft bone; later there is absorption and involvement of periosteal structures. The presence of large quantities of albumin in otherwise normal urine should suggest the possibility of multiple myelomas, especially if there has been a complaint of lumbago, chest pains, neuritis or rheumatism. When the disease affects the spine and remains localized it may simulate tuberculosis, and there have been cases in which bone-graft operations have been performed on this diagnosis.⁸ Deformity of bone and fracture may develop. Soft tender masses of the sternum, ribs and clavicle are not uncommonly palpable. I have previously reported⁶ fourteen cases of this disease in which the youngest patient was forty-three years, the oldest sixty-nine, the average age being forty-nine plus. Nine were females and four were males. Remissions of symptoms may occur. The prognosis is poor. The patient may live from a few months to five years.

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additional drugs added to Korex and put it out under the name "Hiobin," and created a paper organization called the "Hiobin Co." Then Stunz brought out a "Kidney Cure" that he called "Renex." This was sold by the Renex Co., another "paper concern." All three of these nostrums came from the same address; but the public had no means of knowing this, as the addresses were camouflaged to cover this fact. On August 13, 1924, the Melton Laboratories (H. M. Stunz, manager), the Hiobin Co., and the Renex Co. had a fraud order issued against them barring them from the use of the mails.

(*Jour. A. M. A.*, Aug. 29, 1925, p. 694.)

THE TREATMENT OF ACUTE APPENDICITIS*

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The mortality rate of acute appendicitis is too high. Statistics from our best hospitals show a mortality rate of 5 to 10 per cent.

The late John B. Murphy stated, "It can be laid down as a rule that the case of acute appendicitis coming to operation with pus outside the walls of the appendix has not been properly treated up to that time."

In addition to the unwarranted high mortality rate, there is a high morbidity, such as prolonged drainage, fecal fistulae, adhesions, liver infections and other complications from failure in prompt treatment. Prompt treatment of appendicitis is without mortality.

Ochsner, in a personal communication in June, 1924, states, "I have had no deaths in cases which have been operated upon in the first twenty-four hours in which cathartics or food have not been given prior to operation."

The death rate of 5 to 10 per cent in our leading hospitals is proof that there is something radically wrong. The cause of this high death rate and high morbidity is late diagnosis and delayed operation. There are two reasons for this delay. First, the widespread practice among the laity in taking cathartics without medical advice as soon as they feel any abdominal pain, believing that free evacuation of the bowels will stop their symptoms. In many cases, a physician is not called until a spreading peritonitis places the patient beyond help by any treatment. In the second place, many of the general practitioners are in the habit of temporizing with acute appendicitis with the expectation that an opiate and a cathartic will relieve their symptoms, and waiting until irreparable damage has been done. Many cases of acute appendicitis have perforated in the first twelve hours.

Diagnosis in the average case is easy. Many cases in the beginning show few characteristic symptoms. Many physicians hesitate to diagnose acute appendicitis in the absence of fever and increased pulse rate. Many cases of acute appendicitis proceed to gangrene and perforation without elevation of temperature or pulse rate.

Every case of acute appendicitis should be submitted to operation as soon as possible in the first forty-eight hours. No case should have food or fluids by mouth after the onset of acute symptoms.

There is much difference of opinion regarding the method of procedure after forty-eight hours have passed. One group, headed by Ochsner, who has many supporters, believe in the conservative treatment after the forty-eight-hour period has passed, and advocate opiates and the administration of fluids by every method to prevent dehydration. The other group advocate operation at any time as soon as the diagnosis is made. Comparing results and statistics from clinics where both methods are used, I believe that the advocates of the Ochsner treatment show better results.

It cannot be stated dogmatically that no case should be operated upon after the lapse of forty-eight hours. As a general rule, more lives will be saved by conservative treatment—following the Ochsner plan after forty-eight hours have passed—in the group of cases referred to by the late Maurice Richardson as "too late for early operation and too early for late operation."

A certain percentage of the cases coming too late for early operation may need surgical relief in the form of drainage or enterostomy. A certain group can be operated upon with relatively small risk even after the forty-eight-hour period, depending upon the skill and diagnostic ability of the individual operator.

In our work from 1904 to 1917, about 700 acute cases were seen, of which 362 were operated upon in the first forty-eight hours with no fatalities. These cases showed all degrees of pathology from the acute catarrhal stage to gangrene, perforation and local peritonitis. In several of these cases where distension and vomiting persisted to a threatening degree, in spite of frequent enemas and gastric lavage, enterostomy was performed under local anesthesia. In one case, three enterostomies were performed on the same patient.

In the group coming under observation after forty-eight hours had passed were approximately 350 cases. Most of these had received food and cathartics. Many had received opiates from their medical advisor. Seven of these, or approximately 2 per cent, were moribund on admission. In several of these late cases, simple drainage was instituted, and in several others enterostomy was performed with gratifying results.

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

One in this late group, a boy of twelve, came to the hospital giving a history of six days of acute abdominal pain following tonsillitis. He had extreme abdominal distension, but did not respond to enemas and gastric lavage and his general condition was poor. Enterostomy was done under local anesthesia and he made a nice recovery. Two years later, he returned in a similar condition, too sick to stand any radical operation, and enterostomy again relieved his symptoms.

Concerning the advisability of operation after the first forty-eight hours have passed, there is one group of cases which we never operate upon until four to six weeks after the disappearance of acute symptoms. I refer to the localized abscess in the patient who is doing apparently well. I have seen several of these patients operated upon in the acute stage. The mortality rate was large. In many cases, the appendix could not be removed. Where the appendix was removed and a large number of drainage tubes used, many had subsequent trouble from adhesions. The localized abscess in the group referred to, with the appropriate medical treatment, will clear up completely in most cases so that in four to six weeks a clean, safe, easy operation can be performed without drainage and, as a rule, without any postoperative sequæ.

The next group of cases coming after the forty-eight-hour period has elapsed are the individuals that have had a comparatively mild attack and are doing fairly well, and we find no clinical signs of perforation or localized abscess. These patients can be operated upon safely and should be operated upon.

In five of our patients in whom liver abscesses developed, four had a comparatively mild attack of appendicitis without perforation and were apparently making a nice recovery from their acute attack.

OPERATION

In our earlier work, the McBurney incision was used exclusively. In later years, the incision in the outer edge of the right rectus muscle has been employed in most cases. This offers several advantages:

1. If the appendix is high or in the pelvic position, the incision can be extended as needed.
2. In a perforated appendix in the pelvic position, the incision in the rectus muscle gives easier access to the trouble.

3. It gives a shorter drainage tract for pus in the pelvis. Pus in the pelvis is a frequent and serious complication of the perforated appendix, no matter what position the appendix occupies.

4. It allows easier application of a modified rubber-covered Mikulicz's drain placed in the pelvis so as to hold the coils of the terminal ileum out of the pelvis. It permits better strapping of the wound in cases where it is deemed better to strap the wound after the manner of MacLaren¹ instead of suturing.

As soon as the incision reaches the peritoneum the assistant holds the vacuum pump ready so that it catches the first drop of pus escaping, thus minimizing the soiling of the wound. The pump is gradually advanced to the bottom of the pelvis so that all free pus is removed without sponges. The next step is the introduction of flat Deaver retractors so as to hold the coils of the intestines out of the way, and particular care is taken that no coil of intestine is allowed to protrude. The appendix is located preferably by sight; and, if this is not possible without disturbing adhesions or manipulation of the intestines, it is located and delivered by touch. In the presence of pus, where the walls of the cecum are edematous and friable, the base of the appendix is crushed, a catgut ligature applied, and the stump of the appendix carbolized, no attempt being made to cover the stump with peritoneum.

Drainage.—It has been our practice to drain every case where a green or black spot shows on the appendix. In every case where pus is present in considerable amount, a half-inch soft rubber tube is placed to the bottom of the cul-de-sac. In all cases where considerable pus is present, no matter what the location of the appendix, there is always some pus in the pelvis. In cases where fibrinous adhesions are present in the coils of the small intestine, a modified Mikulicz's drain, rubber-covered, is placed to the bottom of the cul-de-sac in such a way as to hold the coils of the ileum out of the pelvis and away from the pelvic structures. I have found that a rubber glove packed with strips of gauze answers this purpose well.

Many of the cases were operated upon with local anesthesia supplemented in some cases with gas or ether. A few cases in children were operated upon with local anesthesia and nitrous-oxide-oxygen anesthesia.

Suture.—In our earlier cases, pus cases were sutured. In later years, after MacLaren's publication advocating strapping, we have followed this method and believe that the patient gets out of bed quicker and the wounds heal with less tendency to postoperative hernia because there is no sloughing of the fascia. The peritoneum is sutured up to the drains so that the coils of intestines cannot protrude, and the rest of the wound is strapped with adhesive strips, which are thoroughly flamed before being applied. It is remarkable how nicely and rapidly these wounds have healed in comparison with the sutured cases, where much of the fascia sloughs away. Where we use the packed rubber glove, the packing is gradually removed after the first forty-eight hours, and as soon as all the packing is removed the rubber glove can easily be removed by twisting.

Postoperative Posture.—All patients in whom pus is present are turned on the right side with knees flexed. Where we fear necrosis of the walls of the cecum, we do not use the Murphy drip, but prefer subcutaneous administration of tap water. In children it is often advisable to give a pint of water intravenously while on the table.

Our percentage of postoperative hernias in the drainage cases has been 3 per cent. These all occurred with the McBurney incision. Since adopting the right rectus incision and strapping of the wound after MacLaren's method, we have had no complaints of postoperative hernias.

At a recent visit to the clinic of Drs. Quain and Ramstad, I had the privilege of seeing several cases of acute perforated appendicitis operated upon. They are using the McBurney incision. It has been Dr. Quain's observation that the hernia following appendectomy with drainage usually starts at the linea semilunaris, and particular care is taken to reconstruct the linea semilunaris, but at the same time placing no other suture in the fascia of the external oblique.

Enterostomy.—For the last twenty years I have resorted to enterostomy many times in the treatment of peritonitis. I have been compelled to resort to this measure in several patients who were operated upon in the first forty-eight hours and in many who came in after the forty-eight-hour period, and also in peritonitis of other forms where the patient came in in such a condition that a radical operation was not warranted.

Sampson Handley² describes what he calls "ileus duplex" and argues that mechanical obstruction due to local peritonitis, causing adhesions of the terminal ileum in the pelvis is the initial stage of general peritonitis in many cases. In his early cases, he performed ileocolostomy to short circuit the obstruction. Many of his patients died. This is a severe procedure on a patient who is already in a serious condition, and I believe that timely enterostomy done with local anesthesia will tide the very ill patient over the danger point. In order to be effective, the enterostomy should be done before the obstruction has done so much damage that the distended ileum fails to respond.

This valued aid in treating peritonitis of any origin has not received the attention it merits. Dr. Cooney³ of Princeton has performed enterostomy many times at the time of removal of the appendix and with gratifying results. Dr. A. N. Collins⁴ has also used enterostomy at the first operation. So much has been written lately about the technique of enterostomy that no description of this life-saving measure is necessary.

CONCLUSION

If all cases of acute appendicitis were submitted to operation within the first twenty-four hours, we should have no deaths from appendicitis or its complications.

To reach this end, a campaign of education with our patients, warning them of the danger of giving a cathartic at the onset of any acute pain in the abdomen, is needed.

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DISCUSSION

DR. DONALD K. BACON, St. Paul: I think Dr. Bratrud's paper was exceptionally good and to almost everything he said I can subscribe without reservation, but I would like to add a few remarks on the subject of drainage. Drainage is something that when properly done is a life-saving measure, but if improperly done the patient may succumb in spite of it. (Illustrating on blackboard.) Let us assume this is the abdomen, this represents the liver, and here is the stomach. At this point (indicating) the intestine becomes retro-peritoneal around to approximately there, where the jejunum emerges. Then if we consider the mesenteric attachment, this runs obliquely down and across the abdomen to the ileocecal junction, then upward to the hepatic flexure, over to the splenic flexure and down to

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the rectum. At several points here the colon is retroperitoneal. When the surface is covered with peritoneum this arrangement of the mesentery leaves very definite pathways along which infection from a perforated appendix will extend. At this point (indicating) we have the appendix. The infection would first of all tend to gravitate into the pelvis when it extends beyond the localized abscess stage. It will, secondly, extend upward to the right of the ascending colon toward the region of the right kidney and, third, it will extend into the intermesenteric region between the small intestine and the descending colon. The region between the mesentery of the small intestine, the ascending colon and the transverse colon is less frequently affected, and the same is true of the region to the left of the ascending colon. That leaves in the average case of peritonitis three regions to be drained. These are the regions in which the largest collections of pus will be found at operation, or where drainage has been neglected. In rare instances it may be necessary to put a drain across the cecum and the ascending colon into this region, and here (indicating), if the abscess has extended up into the subphrenic region. I use three drains, one to the pelvis, one to the right kidney region, and one in the intermesenteric region between the descending colon and the small intestine. Those will cover 90 per cent or better of the cases, and after the natural immunity of the patient has been fortified by plenty of water, rest and quiet for the intestines, so the infection will not spread, these drains may be slowly removed, an inch or two a day, which will give a maximum of results with a minimum of trouble.

DR. FREDERICK J. PLONDKE, St. Paul: In the cases with localized abscess which the doctor suggested should be postponed from four to six weeks, I wish to cite a case which shows the danger of allowing these cases to continue.

Some time ago a boy of about six came to the hospital after having been sick for six days. There was a mass in the right iliac region which showed localized abscess. We decided to postpone operation and watch it. On the night of the third day I was called by telephone and informed that the patient was taken suddenly with severe pain in the abdomen. When I arrived at the hospital an hour later the patient was in shock, somewhat distended, tender and complaining of severe pain all over the abdomen. The abdomen was opened at once under novocaine anesthesia; large quantities of foul-smelling pus were found free in the abdominal cavity, completely filling the pelvis. It was evident that the abscess had ruptured a short time previous, spilling its contents into the general abdominal cavity. Drains were inserted, but the boy died two days later of general peritonitis. I mention this case to show that it is not always safe to treat these cases conservatively.

Dr. Bratrud spoke of the danger of cleansing the abdomen of pus. Generally speaking, I think he is right. There are cases, however, where your better judgment seems to tell you that some effort should be made to relieve the

patient of the continued absorption, which is bound to take place if the pus is allowed to remain in the pelvis and in pockets between the coils of intestine. In such cases we place our hand in the abdomen, gently holding back the intestines, and pour ether into the pelvis, swabbing out carefully; or preferably removing with suction apparatus, repeating it several times. This literally washes out the pelvis and drains the pockets in the lower part of the abdomen. Ether is not an antiseptic, but there is no question that it has an inhibitory effect on bacteria.

Tarnowsky, of Chicago, has made some interesting reports on the use of ether in septic cases. We do not, however, agree with him that ether should be left in the abdomen without providing means of escape by way of drainage.

As to drainage: we have not yet reached the stage where we can feel positive when and when not to drain. We believe that drainage is used in many cases where it is unnecessary. Yet the present tendency to close the abdomen in most cases whether there is free pus or not, I believe is going to extreme.

In the majority of our acute cases we do an appendicostomy; this is done by placing forceps through the opening in the stump, dilating it and inserting a tube into the cecum and holding it in position by a double purse-string suture. This allows the gas to escape and often makes the enterostomy mentioned by Dr. Bratrud unnecessary.

Enterostomy is a life saver and should be done oftener and sooner. It is asking too much when we expect nature to combat infection both in and outside of the intestine; by relieving the distention and removing the toxic contents the circulation in the intestinal wall becomes re-established. This decreases the danger from absorption within the gut and must surely increase the power of resistance in its peritoneal covering.

DR. THEODOR BRATRUD, Warren (closing): Of course, there is always danger with a localized abscess, but my observation has been that the case that comes in late with a localized abscess that is doing well clinically will do better by waiting. The abscess usually absorbs. Occasionally it ruptures into the belly. In nearly all cases after four or six weeks you can go into the belly and find that every sign of abscess has disappeared and you can then do a clean operation, whereas if you operated in the presence of the pus you would very likely get hernia, adhesions, sloughing of fascia or some other bad results. Balancing the conservative treatment against the other, I think we can save more lives by conservatism. We tried the method of washing out abscesses with ether for two or three years and then we abandoned it again. So far as we could see it made no difference whether we used ether or just used the suction pump to remove the pus. I think the important thing is to avoid traumatizing the tissues. It is the abrasion of the serosa of the healthy tissues that is the start of the trouble, i.e., adhesions and spread of infection.

PRODUCTION AND HEALING OF PEPTIC ULCER: AN EXPERIMENTAL STUDY*

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Williamson and I have previously reported a method for the experimental production of peptic ulcer in the dog. The characteristic peptic ulcer usually occurs in a mucosa, pyloric and duodenal, which, although secreting an alkaline secretion itself, is exposed to an acid medium. It would thus seem that the acid might be a direct or indirect factor in producing the lesion. Our results in a preliminary series of experiments in which acid was administered orally, as well as the results of previous investigators, demonstrated that simulating the so-called hyperacidity and hypersecretion by the artificial administration of acid would be very difficult. As was reported in the previous article, the degree of acidity and the amount of acid to which the ulcer-bearing area of the gastric intestinal tract is subjected depends not only on an acid-producing mechanism, but also on an alkali-producing mechanism. The acid secreted by the gastric mucosa must be neutralized before the action of the pancreatic enzymes can be effective. The neutralization not effected by the food must be effected by this alkali-producing mechanism, which consists of three secretions: the intestinal (also the secretion of the pyloric mucosa), the pancreatic juice, and the bile. Enough alkali must be produced by these combined secretions to neutralize the acid that passes the pylorus, if digestion in the intestine is to be carried out normally. The upper portion of the intestinal tract can be subjected to an acid medium just as effectively by damaging the alkali-producing mechanism as by the administration of acid. We therefore undertook to eliminate singly, and in combination, the various constituents of this mechanism, and found that the damage of any one of these constituents caused the development of a typical chronic peptic ulcer in a small percentage of experiments. We finally devised a method which consisted essentially in draining this alkaline secretion, which is poured into the duodenum, into the ileum at a considerable distance from the point of emergence of

the acid from the stomach into the intestine. Following this procedure, a typical peptic ulcer developed in a high percentage of experiments. It usually developed within a month or two after operation, and always in the jejunal mucosa just distal to the suture line, usually slightly posterior and to the right. As a rule there was only one ulcer, but sometimes there was a contact ulcer, and occasionally there were three ulcers. Generally they were relatively large and perforated the entire thickness of the jejunal wall. Grossly and microscopically the ulcers presented the same general characteristics as those in man.

After careful study of the development of the ulcers in various stages, it seemed desirable to know whether they would heal, and, if so, what the healing process would be like. Accordingly, after an ulcer had developed in certain animals, its site was explored, the character of the lesion observed, measurements were taken, and in some instances a specimen for histologic study was secured. Then the pyloric opening was occluded proximal to the ulcer to prevent the passage of gastric contents over it, and the stomach drained with a gastrojejunostomy, the stoma in the jejunum being 25 to 30 cm. distal from the ulcer. The ulcer was then examined at various periods after the operation.

Following this procedure the ulcers healed with remarkable rapidity. Within four days their bases were clean. In ten days the ulcers had usually greatly decreased in diameter and depth, and the mucosa had begun to grow in from the edges. On the twentieth day three-fourths or more of the base of an ulcer was covered with mucosa. Before the thirtieth day it was almost impossible to find the site of a lesion. An ulcer, 1.5 cm. in diameter and 0.5 cm. in depth, which had perforated the entire thickness of the jejunal wall, would almost entirely disappear within twenty-five days after protecting it from the gastric contents. The base, which was hard and indurated, became soft and thin, sometimes bulging like the wall of a diverticulum.

Closing the pylorus and draining the stomach by a gastrojejunostomy not only prevent the acid from reaching the ulcer, but place at rest the loop of intestine bearing it. In order to determine whether both procedures were necessary, in one series of experiments the duodenum was drained back into the loop bearing the ulcer. Thus both

*Read before the Minnesota State Medical Association, Minneapolis, April 27-29, 1925.

gastric and duodenal contents could pass over the ulcer. The results were variable. There was always some healing. If the lesion was so situated as to be somewhat protected after the last operation, healing was almost complete, as in the first series of experiments. If the ulcer was fully exposed to both secretions, healing was slow and irregular. These experiments seem to show that the alkalization of the gastric contents is of major importance in aiding the healing of these ulcers, but that the mechanical factor of the secretions pouring over the ulcer is also a factor of importance in preventing or retarding the healing.

The healing of the ulcer was studied both macroscopically and microscopically. Macroscopically the first evidence of healing was the disappearance of exudate and débris from the base. The ulcer appeared to grow shallow, due to a filling in of the base by new granulation tissue, which, together with the overhanging edges of mucosa, completely filled the base. Gradually the edge of mucosa grew from the periphery toward the center, usually pushing the granulated tissue up and out like a plug. At first the mucosa was thin and smooth, but it gradually thickened and was thrown into folds. The inflammation in the base subsided and the hard induration disappeared. Microscopically, the development of the granulation tissue and the growth of the mucosa and connective tissue could be closely observed. As the base of the ulcer became clean, the leukocytes disappeared, and granulation tissue developed, which was usually very vascular; it can readily be surmised that if the base of a healing ulcer is injured considerable hemorrhage might occur. Usually a thin limiting membrane of connective tissue formed over the base of the ulcer. The mucosa grew in from the edges over the surface of granulation tissue. At first the mucosa consisted of but a single layer of flat or cuboid cells on a basement membrane. Later the cells became typically columnar. Often the growing edge of mucosa was under an overhanging, protecting edge of the plug of granulation tissue in the center. As the cells of the mucosa increased in number and size, the smooth growing surface was thrown into small folds which carried the newly formed connective tissue with it. At first the folds were small and wavy, but as the mucosa grew, the typical normal villi appeared. The growing edge of mucosa was very fragile, and it can readily be seen how easily it would be de-

stroyed by the passage of the gastric contents over it. As a matter of fact, we were never sure we were studying the ultimate edge because, even with the most careful technic in preparing the specimen, it always seemed as though some of the edge were lost.

Early in the healing of an ulcer the macroscopic changes are more noticeable than the microscopic changes. While to the naked eye or under a dissecting microscope the appearance of an ulcer which has been protected from the gastric contents for a few days may be quite different from its appearance at the time of exploration, a microscopic study does not reveal such a marked change. While histologically the protected ulcer presents definite changes from the specimen removed at operation, a careful study reveals a similarity of the various processes in the two specimens. This observation revealed the fact that the healing processes were active in the ulcers at all times, but when the ulcer was unprotected from the gastric contents the newly formed cells were destroyed before they could become an integral part of the tissue.

Although we developed the method for producing the ulcer on the basis that a discrepancy between acid and alkali production might be an important factor in the production of ulcer, and although the ulcers thus produced heal very quickly when protected from the gastric contents, it must not be considered as proved that the acid factor is the only one in the etiology of these ulcers. While the gastric contents are without a doubt of major importance, other factors also are involved.

SUMMARY

A method is described for the production of a lesion in the dog which resembles in most particulars peptic ulcer in man. The essential procedure is to drain the contents of the duodenum into the ileum at a considerable distance from the point of emergence of the acid from the stomach. Following this procedure, a typical peptic ulcer developed in a high percentage of experiments; it usually developed within a month or two after operation and always in the jejunal mucosa just distal to the suture line, usually slightly posterior and to the right. If the ulcer is protected from the gastric juice coming in contact with it, healing is complete and remarkably rapid.

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DISCUSSION

DR. E. T. BELL, University of Minnesota, Minneapolis: As Dr. Mann is the first to have produced a chronic ulcer experimentally, we should be very proud that this work comes from our state. I think this is the first definite step in determining the cause of peptic ulcer.

ANTI-PHYMIN

This, modestly described as "the healing gas" and "the greatest curative agent known," is at present prepared by the Phymos Chemical Laboratories of Pensacola, Florida. It is said to be "nonpoisonous to the fullest extent"—whatever that may mean. As is common with quacks, the exploiters of Anti-Phymin have a simple explanation for the complex facts of pathology. All disease, according to the Anti-Phymin thesis, is caused by fermentation. Anti-Phymin, it is claimed, stops the fermentation—and there you are. Anti-Phymin is said to be the discovery of one Cock. In 1916, he was conducting the "Cock Camp Colony and Laboratories" at Kingsland, Texas. This was a "consumption cure" affair in which Anti-Phymin was a part of "the system of treatment." Now, Anti-Phymin is recommended for such a broad field as sore throat, pyorrhea, asthma, "disorders of the stomach," poisoning, "disorders of the kidney and liver," diseases peculiar to women and venereal diseases. It is also claimed to have cured many cases of pulmonary and bone tuberculosis and is recommended for gall-stones, pellagra, appendicitis and diabetes. The A. M. A. Chemical Laboratory examined Anti-Phymin and found it to consist of a dilute solution of sulphurous acid and, necessarily, a small amount of sulphuric acid. This shows that Anti-Phymin belongs to the class of "Liquozene," "Radam's Microbe Killer," "Oxytonic," "Septicide," "Zymatoid" and other nostrums containing, as their essential ingredient, sulphuric and sulphurous acid.

(*Jour. A. M. A.*, Aug. 15, 1925, p. 535.)

THE PARATHYROID HORMONE

The recently reported studies make it more than likely that suitably prepared parathyroid extracts contain a substance or substances that will afford complete replacement therapy in the case of the totally parathyroidectomized dog. The methods thus far developed indicate that any extract of fresh ox gland that has been made by a process of weak acid hydrolysis and is sufficiently concentrated contains more or less of the active principle. It has been proposed to use as a provisional unit of potency one one-hundredth of the amount of extract that will produce an average increase of 5 mg. in the content of calcium in the blood serum of the normal dog of approximately 20 kg. of body weight over a period of 15 hours. There should be no haste in a possible human application of the parathyroid hormone. Injection of even very small amounts frequently repeated have invariably proved fatal to animals when the injections were continued.

(*Jour. A. M. A.*, Aug. 8, 1925, p. 441.)

PERFORATED ULCER*

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The seriousness of the situation in case of acute perforation of the stomach or duodenum, and the wonderful opportunity to save life by an immediate operation, are reasons enough for presenting this subject for your consideration.

Harrigan¹ says, "Perforation of a gastric or duodenal ulcer is one of the gravest emergencies in abdominal surgery. Peritonitis is the inevitable sequence, unless the condition is checked by operation."

Many of our patients are going about today with stomach or duodenal ulcers, which may or may not be causing discomfort.

Spect² reviewed 3,224 ulcer cases at the Dresden Hospital, and estimated that 10 per cent are apt to develop perforation sooner or later. He also found that among the perforated cases about one-half had no history of ulcer symptoms before the perforation occurred.

A. H. Noehren³ estimated that 7 per cent of all duodenal and 20 per cent of all gastric ulcers would perforate. He also claims that he found more than one ulcer in 27 per cent of his cases.

Men are much more likely to have perforation of ulcer than women, the proportion being 3 to 1. All of our cases have occurred in men.

The diagnosis of perforation is not made by observing a large number of symptoms or signs, but the few symptoms that are present are so striking and definite that a diagnosis in the beginning is not difficult. At this stage, there are only two symptoms worthy of consideration. They are sudden, violent pain and board-like rigidity of the upper abdomen. The pain is intense, excruciating, and often described by the patient as knife-like. It is continuous; not colicky, as in intestinal colic or acute indigestion. The pain of perforation is not relieved by morphine. The patient lies in a tense, fixed position, often screaming with pain and calling for relief. After the pain begins, he usually vomits, but does his best to prevent its recurrence, for fear of aggravating his suffering. He may be in shock; cold and clammy. A severe pain coming on within a few minutes of the perforation,

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

and felt in the supraclavicular fossa, usually the left, is a symptom often overlooked. It seldom lasts more than 15 minutes, and Gibson⁷ considers it almost pathognomonic.

A large proportion of perforations occur close to the pylorus, and on its anterior surface. If the perforations occur on the posterior stomach wall, the intense pain will be in the back. Perforations on the anterior gastric wall, near the cardiac end, are very rare.

After two hours, the condition gradually changes. The patient is becoming somewhat toxic from absorption. Morphine is now very effective, and the patient and his friends, and often the attending physician, think he must be better.

If the perforation is in the duodenum, its contents have gravitated down the ascending colon, to the right iliac fossa, and now, two or three hours after the perforation, the greatest tenderness and rigidity is in the region of the appendix.

If the perforation has been gastric, the stomach contents have flowed down over the transverse colon, and collected in the pelvis, giving early signs of peritonitis. The leukocyte count, at first normal, is now 12,000, 15,000 or 20,000. The differential diagnosis is more obscure, and unless the physician keeps in mind the sudden onset of terrible, epigastric pain, accompanied by early rigidity, he is very apt to make a diagnosis of acute appendicitis.

Hertz⁴ reported sixty cases, forty-three of which were admitted to the hospital wrongly diagnosed as appendicitis.

The loss of liver dullness sign should not be considered. It is unreliable, and usually absent until the case has reached the general peritonitis stage. However, some gas does usually enter the peritoneal cavity early, and if the patient is where a fluoroscope can be used, it will be found in the highest portion of the abdomen, when he is placed in various positions.

There are several conditions whose symptomatology so closely resemble perforated ulcer that they should be eliminated. Among them are acute pancreatitis, mesenteric thrombosis, acute gastric dilatation, gastric crisis of tabes dorsalis, food poisoning, appendicitis, gallstone colic, and internal hernia.

Prognosis.—All writers agree on one point, and that is, if these perforation cases are operated within six hours, 100 per cent get well. If the case is held twenty-four hours, the mortality will

be 45 per cent, and after forty-eight hours, practically 100 per cent die.

Dever⁵ says, "Better an early operation by an indifferent surgeon, than a late one by a master."

We occasionally hear of deaths from acute indigestion, but proper investigation would prove, in the majority of instances, that there was a perforation of either duodenal or gastric ulcer. The burden of the diagnosis and prognosis rests with the general practitioner, and if he be a physician who prides himself on being conservative, one who always postpones operative procedure as long as possible, the prognosis will be extremely grave. Many of his patients will have passed into the second or third day of the illness, when they are cold and blue and toxic from a general peritonitis, before the surgeon sees them. The prognosis in these cases will be about 100 per cent mortality. Fortunately, the number of physicians who procrastinate is rapidly becoming fewer each year, and the real object of this paper is to help reduce that number to a minimum.

Treatment.—The treatment of acute perforated ulcer is surgical, exclusively, and the most important consideration is early diagnosis and operation.

The long, median epigastric incision causes less bleeding, may be more rapidly and securely closed, and gives plenty of room.

Butler⁶ says, "There is a great difference of opinion as to whether or not to do a gastroenterostomy after suture of the ulcer." There are about an equal number of writers for and against it, but one gets the impression from those who report the largest number of cases that, in competent hands, gastroenterostomy is advisable, unless the patient is too sick, from shock or toxemia, to warrant the procedure.

Many reserve gastroenterostomy for cases of partial obstruction, or those which they think will have future trouble. If the surgeon is one who is not familiar with the technic of gastroenterostomy, he should simply close the ulcer, and leave any further operative procedure for the few who have later trouble.

However, a careful review of the literature leads one to conclude that gastroenterostomy is the method of choice and is growing in favor, for as Lewis⁷ says:

- (1) Gastroenterostomy done immediately does not increase the mortality.
- (2) It simplifies postoperative treatment.

- (3) Simple closure of perforation will not cause a cure of the ulcer in a considerable number of cases.
- (4) Gastroenterostomy will insure proper drainage of the stomach contents, and overcome partial obstruction of the pylorus, caused by postoperative adhesions.
- (5) Closure of the perforation, gastroenterostomy and pyloric exclusion, should be the method of choice in the treatment of pyloric and duodenal ulcers.
- (6) Simple closure of the perforation should be reserved for only those patients whose general condition is so poor that even a rapidly performed gastroenterostomy would be too much of an operative risk."

How shall we take care of the fluids which have escaped into the abdominal cavity? Flushing out the peritoneal cavity is not advisable. Aspiration is the simplest method, and careful sponging may be done, where food is present in large quantities. Drainage may be omitted in the six-hour cases, or a soft rubber tube may be used, reaching to the right kidney fossa. We have been in the habit of using suprapubic drainage in our cases.

CONCLUSION

Sudden, severe epigastric pain, accompanied by board-like rigidity of the upper abdomen, should make one suspect acute perforation, and surgical intervention should be advised at once. Whether or not a gastroenterostomy is done, should be determined after the abdomen is opened.

An operation done within six hours gives practically 100 per cent cures, regardless of the type of operation.

Cases not operated before forty-eight hours nearly all die.

TEN CASES—PERFORATED ULCER

Total number	10
Male sex	10
Age	26 to 68
Previous ulcer history	6
Typical onset	10
Hour of operation	8 to 36
(Average)	plus 15
Diagnosis made	4
Simple suture	5
Suture with gastroenterostomy	5
Deaths	1
Recoveries	9

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DISCUSSION

Dr. JAMES E. ARNOLD, Vernon Center: I have listened to Dr. Holbrook's paper with a great deal of interest. As Dr. Holbrook has said, it is up to the general practitioner to make an early diagnosis and call in surgical consultation or to take the case to a hospital at once for an early operation or observation. Because, in the largest majority of cases it is the family doctor or general practitioner who is called for in an emergency of this sort. If he does not recognize the seriousness of the case and advise an immediate operation he is going to find at the end of two or three days a well-developed general peritonitis with all its seriousness and with little hope of recovery for his patient.

I think you will all agree with me that this is true in the largest majority of cases. However, there are exceptions to this rule and it is possible to have a perforation without a general peritonitis, providing it is a small one and it is immediately walled off by adhesions or the area is already covered by adherent tissue.

As nearly as I can sum up in going over the cases of perforation I have seen, the average general practitioner would see one or two cases of acute perforation in three years. I have seen a good many cases of severe appendicitis and acute renal or biliary colic, but have seen just one case of ruptured duodenal ulcer in a period of three years.

In this particular instance the family called by telephone about 1 A. M. and told me to come at once and to hurry. I had three miles to go. As soon as I got out of the car I could hear the patient. He was groaning loudly and at times yelling with pain. When I entered the room I found him lying absolutely still—not moving a muscle—but he could not keep from yelling with pains at times or making some sort of an outcry. He was not the least hysterical in type. It required a hypodermic of morphine before attempting an examination. One-fourth grain had but little effect and in half an hour another fourth grain was given him along with inhalations of chloroform and finally he quieted down enough so I could talk to him.

I thought of gall-stone colic, as I had just seen a severe case recently, but this seemed different. It was more severe. The sudden onset, the board-like rigidity, the very intense pain, as Dr. Holbrook says, are the only symptoms needed for the diagnosis. Besides this, the patient gave a typical history of repeated attacks of gastric distress for many years. Although he had never consulted a physician

for relief or treatment he had often taken soda or milk of magnesia for his gastric distress.

He rested fairly well for five hours, when the pain started again rather suddenly, requiring one-third grain morphine by hypo. I strongly advised going to the nearest hospital at once for operation or observation, but, like most people in rather poor circumstances, he did not wish to do this unless necessary. As a second recourse I urged surgical consultation, but the morphine fooled them and they decided to wait a few hours longer.

To make a long story a short one, I put him on a starvation treatment; water per rectum; no more morphine; and watched him closely for signs of general peritonitis, but much to my surprise and gratification none developed. By the end of a week he had made a fairly good recovery and I was inclined to think he had not had a perforation.

However, he did not pick up as fast as he should and later went to Rochester and was operated by Dr. Charles Mayo, who found the scar of a perforated duodenal ulcer posteriorly which had opened only slightly and had been immediately surrounded by adhesions, and so, with absolute rest, no bad results had followed. The ulcer had healed itself by perforation. Dr. Mayo did a posterior gastroenterostomy and the patient made a fairly good recovery.

Another procedure which is of diagnostic value is a leucocyte count every hour. A rapidly increasing leucocyte count indicates perforation. A steady decrease in blood pressure indicates shock and perforation also.

Finally, let me again call your attention to the value of early diagnosis and early operation.

DR. W. A. COVENTRY, Duluth: The mortality rate of the operation within six hours is very high, and I feel certain that if one starts to do a gastroenterostomy on those patients the mortality rate will be higher than it has been in the past. My own experience is that the best procedure is to go in, stitch over the ulcer and quit.

DR. FREDERICK A. OLSON, Minneapolis: On the Surgical Service at the General Hospital we see several acute perforated duodenal ulcers each year. The diagnosis is usually made in the receiving room, so that we feel that the students as they come out of school are fairly well versed in the diagnosis of this catastrophe. I have been impressed with the possibility that the study of acute perforations may be an aid in finding the cause of peptic ulcer. An understanding of the etiology of ulcer and hence its possible prevention is the one great field in gastro-intestinal medicine or surgery of today.

In acute perforations of the duodenum we see first the acute embolic ulcer which blows out like an inner tube; second, the further erosion with perforation of the chronic ulcer, often of many years' standing. We see about half and half. There is no doubt but some, particularly of the acute embolic type, will do nicely with simple suture, but you can never be sure. It is our custom to do a gastroenterostomy on all of them, agreeing with Deaver on this point even if it might be found necessary to remove the gastro-enterostomy at some future date. The house officers are often asked what they would care to have done in case they might themselves have a similar perforation. After they have observed a number of cases they unanimously

decide in favor of gastro-enterostomy because of the greatly added assurance of recovery and usually an easy immediate post-operative convalescence.

DR. C. B. WRIGHT, Minneapolis: I wish to emphasize one or two points from the standpoint of the medical man. There are many conditions in which one does not immediately call a surgeon, but in all cases of acute abdominal pain I always like to have the best and most experienced surgeon that I can get to examine the patient. Medical men do not see enough of these acute abdomens to rely upon their own judgment in these cases. The surgeons see many of them and should be called at once.

Another thing I wish to speak of is the use of morphine in acute undiagnosed abdominal conditions. I have had the experience this year of seeing two cases of acute rupture of the abdomen in patients who had had morphine and had been kept quiet for several hours, and both died. I believe if they had not had the morphine, but had been allowed to have their pain, they would have sought surgery much sooner than they did and might have been saved.

Another thing is that any medical man who is called in to see a patient with any acute abdominal condition, and that patient tells him that "Dr. So-and-So treated me six months ago," would be wise to get into communication with the doctor by telephone or some way as soon as possible. I constantly see men taking patients to the hospital and operating on them—patients whom they know other men have had under their care and have observed for long periods of time—operating upon them within the first few hours after seeing them without even asking the doctor who has been taking care of the patient what he thinks about the case.

DR. A. E. BENJAMIN, Minneapolis: I have seen a few cases in which mistakes have been made, confusing appendicitis with acute perforating ulcer, and one important case in which the operation had been performed and the appendix removed. The surgeon had failed to look a little higher up. The appendix was diseased, but he did not find the perforated ulcer. That, I think, we should all have in mind when we make an incision, if we are not positive. In acute perforating ulcer this is manifested by an increased leukocytosis and in many other ways. The surgeon should extend the incision sufficiently to examine the stomach and duodenum when in doubt.

There is one class of case that troubles us considerably and that we see few of, and that is the thick and indurated edges of the ulcer that are hard to close. We cannot put a suture that will hold in the tissue to close it over and we may not have any tissue except the omentum to use for this purpose. A recent case illustrates this point. A student at the University with acute symptoms was taken to the hospital. We found a large perforation of that type that we could not close. I used the omentum, but could not close it sufficiently to be sure it would remain closed on account of gas accumulations in the stomach, so we passed a small tube through the nostril, down into the stomach to limit the gastric tension. I think this is a good point to remember. This patient had no discomfort after the operation, because all the gas immediately came

up through the tube. It kept the stomach clean and empty. I think this procedure should be adopted in many an abdominal case as well. In the morning he vomited it out, but remained comfortable. The patient made an uneventful recovery.

DR. J. S. HOLBROOK, Mankato (closing): Of the ten cases we did a gastroenterostomy in five, with simple closure in the others. One of the cases in which we did the simple closure, I remember, had acute obstruction a few months later, and we then did a gastroenterostomy. From my own experience I would not attempt to say which is the best plan, but from those who report most of the cases it seems that it is best to do the gastroenterostomy at the time of the first operation.

I thank the gentlemen for their liberal discussion.

THE NUTROIDS FRAUD

Nutroids has been marketed as "a safe obesity cure" by one R. Lincoln Graham. It was claimed (1) that Graham was "an eminent physician, a stomach specialist who has obtained exceptional honors in his profession," (2) that he had discovered "the real cause of fat," (3) that "obesity is brought about by an overdevelopment of alcohol in the digestive tract," and (4) that Graham had discovered the method of preventing the overdevelopment of alcohol by the administration of the product he called Nutroids. The scheme was essentially a mail order fraud. More recently the nostrum was also sold through drug stores. In due course the postal authorities got round to Graham and his "Nutroids" and secured an agreement that Nutroids would not be sold through the mails. Graham can no longer swindle the public through the mails; if done at all, it must be done through the agency of such retail druggists as are willing to cater to this form of quackery. (*Jour. A. M. A.*, Aug. 15, 1925, p. 522.)

SUPSALVS AND MERSALV

Supsalvs are arsphenamin suppositories put out by the Anglo French Drug Co., and Mersalv is stated by the same firm to be a 10 per cent ointment of metallic mercury. In 1920, the Council on Pharmacy and Chemistry reported unfavorably on Supsalvs, because there was no acceptable evidence of the efficiency of arsphenamin administered rectally. Since then the inefficiency of the rectal administration of arsphenamin has been demonstrated by controlled clinical trials. The identity of the ingredients that form the base of Mersalv is not declared by the manufacturer. There is no good evidence to show that Mersalv—or any other proprietary mercurial preparation—is therapeutically superior to the official ointment of mercury.

(*Jour. A. M. A.*, Aug. 22, 1925, p. 630.)

TUBERCULIN IN TUBERCULOUS ADENITIS

Tuberculin seems to be indicated when the disease is strictly localized, and especially in involvement of the cervical lymph gland. Its administration is carried on in the same way as in the tuberculin treatment for other purposes with doses that produce a slight local reaction but fall short of a general one.

(*Jour. A. M. A.*, Aug. 15, 1925, p. 539.)

CALCIUM IN TUBERCULOSIS

Calcium salts have been administered in the treatment of tuberculosis for various alleged reasons: to remedy calcium deficiency; to lessen inflammatory exudate; to favor calcification of lesions; and to lessen sweating and diarrhea. But calcium is not considered as an essential remedy by critical students of the subject.

(*Jour. A. M. A.*, Aug. 15, 1925, p. 539.)

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VOL. VIII OCTOBER, 1925 NO. 10

EDITORIAL

Inter-State Assembly

With the near approach of the meeting of the Inter-State Post Graduate Assembly in St. Paul this month, we feel that we would be remiss in not again calling the attention of the profession to the importance of this meeting. Next to the annual meeting of the American Medical Association this is the largest medical meeting we know of. Decidedly general in the nature of subjects handled and consisting for the most part of clinics by university professors, the attending physician will be offered a great variety of authoritative information for five solid days. There are no sections to this association. Surgical clinics are followed by medical ones and these in turn by clinics in the specialties. The personnel of the program assures the success of the meeting. The physicians of Minnesota and the Northwest have a feast set at their feet. They should make the most of their opportunity by taking a week off to add to their store of medi-

cal knowledge and receive the inspiration which they are bound to derive from this meeting.

Aside from the eminent clinicians whose names appear on the program of the meeting, certain distinguished foreign guests will take part. These include the Rt. Hon. Lord Dawson of Penn and Sir William Arbuthnot Lane, both of London; Mr. William Blair Bell of Liverpool; Professor Vittorio Putti of Bologna, Italy; Mr. Philip Franklin of London; Dr. H. L. McKisack of Belfast, Ireland; and Dr. W. H. Parkes of Auckland, New Zealand.

Vital Statistics in Minnesota

We realize fully the care that must be exercised in drawing conclusions from vital statistics covering short periods of time. Certain general tendencies can, however, be seen in the tables recently prepared by our State Board of Health covering the past fifteen years.

The most striking reduction in mortality during this period has been in diarrheal diseases of children. This improvement has been marked and progressive almost without a waver from the high point of 1,799 deaths from this cause in 1910 to the low figure of 298 in 1924. General knowledge of the importance of cleanliness in the handling of milk and milk containers and the general habit of boiling milk for infants doubtless account in large measure for this gratifying change. It will be interesting to see whether the statistics for 1925 confirm the impression that there has been more summer diarrhea this summer than usual.

There has been in Minnesota an even greater reduction in the mortality percentage in typhoid fever. During the first five years of the fifteen-year period tabulated there had been over 2,000 deaths yearly from typhoid, whereas during the last eight years this number has been consistently under one hundred. The low figure was reached in 1924, when only thirty-seven deaths occurred.

Mortality due to contagious diseases always varies markedly depending on epidemics. Diphtheria, in spite of the remarkable results obtained with antitoxin, exerts a higher toll than scarlet fever. The general impression, however, is that scarlet fever today is not such a virulent infection as it was a generation ago. The general use in Minnesota of diphtheria toxin-antitoxin and the newly elaborated scarlet fever antitoxin (possibly preventive inoculation also) should materially

OBITUARY

lower the mortality in both these diseases. Measles and whooping cough, although fluctuating widely in their death toll, have each at times during the past fifteen years been the cause of more deaths than either scarlet fever or diphtheria.

As pointed out in one of our previous editorials, the influenza epidemic covered a period of several years, the mortality rate having been definitely above the normal for three years previous to the fateful year of 1918, when 7,521 died of the disease in Minnesota. In both 1919 and 1920 over 2,000 died each year from this cause and even in 1922 and 1923 a sort of back-lash occurred with 402 and 609 deaths, respectively, figures much above the average.

The course of tuberculosis is of interest. Minnesota was a pioneer in anti-tuberculosis activities. The state law providing for county sanatoria went into effect in 1913. With what effect on the mortality rate? During the years from 1910 to 1918 there was no demonstrable improvement in the tuberculosis death rate. In the year 1918 the rate took a jump, doubtless the result of the influenza epidemic. Since 1918, however, the death rate from pulmonary tuberculosis has shown a definite fall from 90.7 in 1918 to the lowest rate on record in Minnesota of 56.05 in 1924. There has been a corresponding decrease in the number of deaths from other forms of tuberculosis since 1918. Whatever the case may be in Europe, tuberculosis has been on the decrease in Minnesota since the termination of the World War.

During the last fifteen years Minnesota has shared in the marked general increase in cancer. Since 1910 the low figure of 1,391 has rapidly and almost without a waver mounted to the high figure of 2,558 in 1924. Neither increase in population nor better diagnosis can account wholly for this startling change. Cancer is on the increase.

It is rather surprising to find no definite increase in accidental deaths in Minnesota during this period. We are led to believe by the newspapers that we are all headed for an automobile death and with the enormous increase in the number of autos and the steady growth in population we would expect a rise in this figure.

We also hear a lot about the number of homicides since the war, as though the civilian army had all gotten the habit of shooting their fellow-men during the war and were continuing it. It is rather gratifying to find there has been no definite

increase in the homicides in Minnesota since the war.

No relation can be seen between incidence of suicide in Minnesota and either business conditions or fluctuations in high cost of living.

Last year heart disease headed the list as cause of deaths in Minnesota as elsewhere. The rates per 100,000 population for the six leading causes of death were: Heart disease, 135.7; cancer, 101; pneumonia, 70.6; accidents, 60.5; nephritis, 58.3; pulmonary tuberculosis, 56.1. Surely, here is an array worthy the best efforts of preventive medicine.

OBITUARY

DR. HUGO HARTIG*

Hugo Hartig was born in Minneapolis, Minn., November 14, 1890, the son of Rev. Henry and Emma Bronner Hartig, and died July 26, 1925, in an automobile accident at Lake Minnetonka.

He was a graduate of the North High School, Minneapolis, and of the University of Minnesota Medical School, 1914, and served his internship at the Elliot Memorial Hospital.

In 1918 he took post-graduate work at the Bellevue Hospital, New York, and in the Cornell Medical School. In the same year he entered the military service and was stationed at Camp Sherman in the United States, and with Base Hospital No. 99 in France until May, 1919.

He became a member of the Minneapolis Board of Public Welfare in 1922 and was appointed County Physician of Hennepin County in 1923. He held a teaching position in the University of Minnesota Medical School in 1917 and 1918 and served on the staff of St. Andrew's Hospital until the time of his death. He was a member of the Veterans of Foreign Wars and was State Commander of that organization.

His wife, Hermina Hermanson-Hartig, M.D., and four children survive him.

In all his relations with the various organizations in which he took an active part he displayed an unfailing industry, a never-flagging energy, and an ever-inspiring enthusiasm. It is rare to find a record of one man who has filled so large a place in a city as he has in his. His few years of professional life stand high on the rising curve of medical progress in his community.

J. C. MICHAEL,

J. H. SIMONS,

OLGA S. HANSEN,

Chairman, Necrologic Committee, Hennepin County Medical Society.

*Read before the Hennepin County Medical Society, Sept. 14, 1925.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

INTER-STATE POST GRADUATE ASSEMBLY

The annual session of the Inter-State Post Graduate Assembly will be held this year in St. Paul, October 12-16, inclusive. Headquarters will be at the Saint Paul Hotel with the scientific program and exhibits at the municipal auditorium.

The scientific program will occupy morning, afternoon and evening each day. The complete program appeared in the September issue of *MINNESOTA MEDICINE*.

Wednesday evening, following a brief evening session, a reception will be tendered the President, Dr. Addison C. Page of Des Moines. This will be followed by an informal entertainment for visiting physicians and their ladies tendered by the Ramsey County Medical Society.

The banquet, which is an annual Friday evening affair, will be held at the Masonic Temple. The banquet hall will accommodate 1,000 and a large attendance is indicated. Tickets will be sold in advance so as to avoid inconvenience of service frequently experienced at such affairs. It is the wish of the officers of the Assembly that the banquet be largely attended by lay men and women as well as physicians and their wives. Many besides the medical profession are interested in modern medicine and will welcome, it is believed, the opportunity to hear the banquet addresses, which will not be confined to medical subjects. The following distinguished speakers will make addresses:

Honorable Theodore Christianson, Governor of Minnesota.

Honorable Arthur E. Nelson, Mayor of St. Paul.

Dr. George W. Crile, Cleveland, Ohio.

Rt. Hon. Lord Dawson of Penn, G.C.V.O., C.B., London, England.

Sir William Arbuthnot Lane, Bt., London, England.

Mr. Charles H. Markham, President of the Illinois Central Railroad.

Dr. Charles H. Mayo, Rochester, Minnesota.

Dr. William J. Mayo, Rochester, Minnesota.

Sir Henry Thornton, President of the Canadian National Railroad.

The importance of obtaining banquet tickets early, preferably before the week of the meeting, is emphasized. Tickets may be obtained from the chairman of the banquet committee, Dr. C. N. Hensel, 1014 Lowry Bldg., St. Paul, Minnesota, on remittance of \$5.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Northern Minnesota Medical Association, held in Brainerd, August 24 and 25, 1925, the following officers were elected for the coming year: President, Dr. O. J. Hagen, Moorhead; vice president, Dr. O. V. Johnson, Sebeka; secretary-treasurer, Dr. F. J. Hirschboeck, Duluth; censor, Dr. W. W. Will, Bertha.

The 1926 meeting will be held in Crookston, the exact date to be decided later.

CENTRAL MINNESOTA DISTRICT MEDICAL ASSOCIATION

The vacation meeting of the Central Minnesota District Medical Association was held Wednesday, August 26, 1925, at the country club at Green Lake.

The following program was given:

"Physiotherapy, general physiological considerations"...

J. R. Sturte, M.D., Watkins

"Mercurochrome in acute infection of the central nervous system"

W. H. Hengstler, M.D., St. Paul

"Exophthalmic goiter—Its diagnosis and treatment"....

James A. Johnson, M.D., Minneapolis

"The present status of prevention and treatment of scarlatina"

C. L. Scofield, M.D., Benson

AMERICAN BOARD OF OTOLARYNGOLOGY

The next examination given by the American Board of Otolaryngology will be held at the Cook County Hospital, Chicago, on October 19, 1925. Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

NICOLLET-LESUEUR COUNTY MEDICAL SOCIETY

The fall meeting of the Nicollet-LeSueur County Medical Society was held at St. Peter State Hospital on Thursday, September 3, 1925. Dinner was served at 6:30 p. m. The scientific program was given over to a lecture, with moving pictures and slides, on "Late Technic in Psychotherapy Methods."

A resolution was passed, thanking Representative Oscar Swenson for interest shown in securing favorable and deserving medical legislation and expressing the approval of his excellent work in the last session of our State Legislature. The secretary was instructed to sign the names of each member of the Nicollet-LeSueur County Medical Society to this resolution.

A second resolution, expressing regret because of the retirement of Dr. R. M. Phelps as Superintendent of the State Hospital, St. Peter, Minn., and of the transfer of Dr. Geo. T. Baskett, the Assistant Superintendent, to be Superintendent at Willmar, Minn., was unanimously passed. They were commended for their faithful and efficient work and helpfulness in society activities.

JOHN D. RICKER, "MAGNETIC MASSEUR"

An advertisement in an Ann Arbor newspaper notified "chronic sufferers" that John D. Ricker, "Noted Magnetic Masseur," would be at a local hotel and advised the blind, the deaf and the halt to come and be cured. The health officer of Ann Arbor believes in protecting the fool from his folly and the sick from the quack and, as a result, he, with other local officials, were on hand to await the arrival of the magnetic masseur. Ricker did not come, but two of his representatives were arrested, found guilty of practicing medicine without license and ordered to get over the state line in the shortest possible time.

(*Jour. A. M. A.*, Aug. 22, 1925, p. 628.)

OF GENERAL INTEREST

Dr. F. R. Walters, formerly of Moose Lake, is now located at Battle Creek, Michigan.

Dr. James K. Anderson, formerly of Deerwood, has become associated with the Sunnyrest Sanatorium at Crookston.

Dr. W. C. Stillwell has severed his connections with the Mankato Clinic and has become associated with Dr. F. H. Paterson at Santa Ana, California.

Dr. Lloyd H. Ziegler, formerly of the Mayo Clinic, Rochester, has become associated with the Colorado Psychopathic Hospital, Denver, Colorado.

Dr. S. N. Mogilner has returned from Vienna, where he has spent some time in post-graduate study, and has established offices at 626 Lowry Bldg., St. Paul, for the practice of his specialty, obstetrics and gynecology.

Dr. H. E. Michelson of Minneapolis has been appointed by the Board of Regents to be the Director of the Department of Dermatology and Syphilology at the University of Minnesota, and will take up his duties at the beginning of the fall quarter.

Dr. Russell D. Carman of the Mayo Clinic, Rochester, has just returned from a trip to Europe, where he visited the X-ray Clinics of Germany, Austria, France, England and the Scandinavian countries. Dr. Carman was accompanied by Mrs. Carman and Dr. and Mrs. Robert J. May of Cleveland, Ohio.

Dr. Russell D. Carman attended the meetings of the Idaho and Utah state medical societies, before which he read papers, the early part of September. The Idaho Association held its meeting at Pocatello, September 3 to 5. The Utah Association meeting was held at Salt Lake City, September 7 to 12.

Dr. Hugo O. Altnow, formerly of Mandan, N. D., and for the past one and one-half years voluntary graduate Assistant and Junior Associate in Medicine in the Medical Clinic of Dr. Henry A. Christian of Boston, has associated himself with the Nicollet Clinic of Minneapolis, Division of Internal Medicine.

An Orthopedic Clinic was held at St. Peter, Minn., September 5, by Dr. Paul Jepson of Rochester, Minn., which was well attended. B. F. Cosgrove, assistant director of the state department of re-education, was present and registered a number of applicants for this work. The Clinic was held under the auspices of the Nicollet-LeSueur County Medical Society.

At the last meeting of the medical course, given at Fergus Falls by the Extension Division of the University of Minnesota on Sept. 7, it was decided by the Park Region Medical Society that a request be made to the University for a similar course next year. The physicians who attended these lectures feel deeply indebted to the men sent out by the University, who so liberally gave of their time for this work and for the splendid way in which their subjects were presented.

The annual Roll Call of the American Red Cross, to enroll members for 1926, will be held this year as usual from Armistice Day to Thanksgiving, November 11 to 26. The American Red Cross, with a membership of three and one-half millions and an additional Junior membership of six millions, has become the recognized agency of the American people for extending special service to suffering humanity. This work is supported through the membership dues secured once a year at Roll Call time. The co-operation of all medical men has been urgently requested.

Twenty-three physicians from the three counties, Goodhue, Rice and Dakota, which maintain Mineral Springs Sanatorium at Cannon Falls, were the guests of the sanatorium at a chicken dinner on August 28. Following the dinner two papers were read, "Early Diagnosis of Tuberculosis," by Dr. W. D. Beadie, superintendent of the sanatorium, and "Tuberculosis in Goodhue County," by Dr. M. W. Smith of Red Wing. According to the figures given the average tuberculosis mortality rate per 100,000 population for Goodhue County, which from 1900 to 1914 was 133, while the state rate was 106 for the same period, became 68 for the five years 1920 to 1924, with a state rate of 77.9. In 1924 the rate was 50 for the county and 67.8 for the state.

Plans were made for the training schools of the three counties to give their student nurses short courses in tuberculosis at the sanatorium as a regular part of the curriculum.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council in Pharmacy and Chemistry:

E. BILHUBER, INC.:

Theocalcin, 7.5 gr. Tablets

LEDERLE ANTITOXIN LABORATORIES:

Anti-Anthrax Serum 20 c.c. Vial

Tuberculin Pirquet Test ("T.O.") 10 Capillary Tubes

Tuberculin Pirquet Test ("T.O.") 25 Capillary Tubes

MERCK & CO.:

Iodipin 40 Per Cent

Ampules Iodipin 40 Per Cent, 1 c.c.

Ampules Iodipin 40 Per Cent, 2 c.c.

H. A. METZ LABORATORIES:

Novarsenobenzol-Billon, 0.15 gm. Ampules

Novarsenobenzol-Billon, 0.3 gm. Ampules

Novarsenobenzol-Billon, 0.45 gm. Ampules

Novarsenobenzol-Billon, 0.75 gm. Ampules

H. K. MULFORD CO.

Proteins Dried-Mulford—Almond, Apple, Asparagus,

Banana, Barley, Bean, Beef, Beet, Buckwheat, Cabbage,

Cantaloupe, Carrot, Cat Hair, Cattle Dander,

Cauliflower, Celery, Chicken, Chicken Feather, Clam,

Cocoa, Codfish, Coffee, Coli (Communis) Bacillus,

Corn, Cucumber, Diphtheroid (Polyvalent) Bacillus,

Dog Hair, Dysentery Bacillus (Polyvalent), Egg-

plant, Egg White, Egg Yolk, Flaxseed, Friedlander Bacillus, Goose Feather, Gonococcus Bacillus (Polyvalent), Guinea-Pig Hair, Horse Dander, Horse Serum, Influenza Bacillus, Kapok, Lamb Protein, Lettuce, Lobster, Mackerel, Meningococcus Bacillus (Polyvalent), Micrococcus Catarhalis Bacillus, Milk, Mushroom, Onion, Orange, Orris Root, Oyster, Paratyphosus Bacillus "A" or "B," Pertussis Bacillus (Polyvalent), Pea, Peanut, Pepper (Black), Pneumococcus Bacillus (Polyvalent), Pork, Potato, Rabbit Hair, Rice, Rice Powder (Polish), Rye, Salmon, Spinach, Squash, Strawberry, Sheep's Wool, Staphylococcus Bacillus (Albus and Aureus), Streptococcus Bacillus (Polyvalent), Sweet Potato, Tea, Tomato, Tobacco, Tuberle Bacillus (Human), Tuberle Bacillus (Bovine), Typhosus Bacillus, Veal, Walnut, Wheat.

PARKE, DAVIS & CO.:

Mercurosal Solution

Neo-Silvol Ointment 5 Per Cent

Neo-Silvol Vaginal Suppositories

Scarlet Fever Streptococcus Antitoxin Concentrated (Globulin)-P. D. & Co.

SHARP & DOHME, INC.:

Caprokol (Hexylresorcinol-S. & D.), 2.5 Per Cent Solution in Olive Oil

E. R. SQUIBB & SONS:

Insulin-Squibb, 10 Units, 10 c.c.

Insulin-Squibb, 20 Units, 10 c.c.

Insulin-Squibb, 40 Units, 10 c.c.

Insulin-Squibb, 80 Units, 10 c.c.

Smallpox (Variola) Vaccine (Glycerinated), 1 Tube

Tetanus Antitoxin Purified, 20,000 Units

STANDARD CHEMICAL CO.:

Radon-Standard Chemical Co.

WINTHROP CHEMICAL CO.:

Sajodin Tablets, 1 gr.

Pituitary Extract Obstetrical-Merrell.—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle, preserved with 0.5 per cent of chlorbutanol. It is standardized so that 1 c.c. has an activity on the isolated uterus of the virgin guinea pig corresponding to not less than 80 per cent nor more than 120 per cent of that produced by 0.005 gm. of standard, defatted, dried powdered posterior lobe of the pituitary gland of cattle. For a discussion of the actions and use of pituitary solution, see Pituitary Gland (New and Non-official Remedies, 1925, p. 260). Pituitary extract obstetrical-Merrell is marketed in ampules containing 0.5 c.c. and 1 c.c. The Wm. S. Merrell Co., Cincinnati.

Pituitary Extract Surgical-Merrell.—A slightly acid, aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle, preserved with 0.5 per cent of chlorbutanol. It is standardized so that 1 c.c. has an activity on the isolated uterus of the virgin guinea pig corresponding to not less than 80 per cent nor more than 120 per cent of that produced by 0.01 gm. of standard, defatted, dried, pow-

dered posterior lobe of the pituitary gland of cattle. For a discussion of the actions and uses of pituitary solution, see Pituitary Gland (New and Non-official Remedies, 1925, p. 260). Pituitary solution surgical-Merrell is marketed in ampules containing 1 c.c. The Wm. S. Merrell Co., Cincinnati.

Solarson.—A 1 per cent solution of ammonium heptachlorate rendered isotonic by the addition of sodium chloride. Solarson contains from 2.25 to 0.275 gm. of arsenic (As) in 100 c.c. Experimental evidence indicates that the arsenic of solarson is readily liberated in the system and is well utilized. It is claimed that solarson has an advantage over the cacodylates because its arsenic is better utilized, and over the arsenilates in that subcutaneous and intramuscular injection produce less pain and are less liable to produce toxic effects. Solarson is used as a means of obtaining arsenic effects in the treatment of anemia, chlorosis, malaria, neuroses and dermatoses. Solarson is supplied in ampules containing 1.2 c.c. Winthrop Chemical Co., Inc., New York.

Bismosol.—A solution of potassium sodium bismuthotartrate (containing 35 per cent bismuth), 10 gm.; pipazine, 0.3 gm., in an aqueous solution of glucose sufficient to make 100 c.c. Bismosol is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis (Bismuth Compounds, New and Non-official Remedies, 1925, p. 73). Bismosol is administered intramuscularly. It is supplied in ampules containing 1 c.c. Powers-Weightman-Rosengarten Co., Philadelphia.

Caprokol (Hexylresorcinol-S. & D.), 2½ Per Cent Solution in Olive Oil.—A solution of caprokol 2.5 parts in olive oil to make 100 parts. For a discussion of the actions, uses and dosage of caprokol, see Jour. A. M. A., May 2, 1925, p. 1338. Sharp & Dohme, Baltimore.

Sajodin Tablets, 1 Grain.—Each tablet contains sajodin, 1 grain. For a discussion of the actions, uses and dosage of sajodin, see New and Non-official Remedies, 1925, p. 182. Winthrop Chemical Co., New York.

Scarlet Fever Streptococcus Antitoxin Concentrated (Globulin)-P. D. & Co.—A scarlet fever streptococcus antitoxin (Jour. A. M. A., May 2, 1925, p. 1338) prepared from the serum of horses treated with subcutaneous injection of toxic filtrates from cultures of scarlet fever streptococci and also with intravenous injections of the streptococci themselves. Each c.c. neutralizes from 35,000 to 40,000 skin test doses of scarlet fever toxin. The product is marketed in packages of one syringe containing 2.5 c.c. and in packages of one syringe containing 10 c.c. Parke, Davis & Co., Detroit. (Jour. A. M. A., Aug. 8, 1925, p. 437.)

Diphtheria Toxin-Antitoxin Mixture 0.1 L+.—A diphtheria toxin-antitoxin mixture (New and Non-official Remedies, 1925, p. 333), each c.c. containing 0.1 lethal dose of diphtheria toxin neutralized with the required amount of diphtheria antitoxin. Marketed in packages of three 1 c.c. vials; in packages of one 30 c.c. vial; in packages of ten vials, each containing three doses. Eli Lilly & Co., Indianapolis.

Typhoid Mixed Vaccine, Prophylactic and Therapeutic.—(New and Non-official Remedies 1925, p. 360.) This is also marketed in packages of three 1 c.c. vials. Eli Lilly & Co., Indianapolis.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

MASSIVE DOSES OF STRYCHNIA IN MYASTHENIA GRAVIS: REPORT OF TWO CASES

C. EUGENE RIGGS, M.D.
St. Paul

Seventeen years ago, I reported three cases of myasthenia gravis. One of these patients died; one is living and the remaining case passed from observation. In all of these I tried strychnia, but not in massive doses. Within the past six months, Dr. Hengstler and I have used strychnina in two patients—a therapy first suggested by Dr. W. O. Bridges of Omaha, but in 1922 popularized by Dr. Charles Dana.

CASE 1. Miss E., aged 22. Present illness began two and one-half years ago with pain in the back of the neck. The "nasal" or "canine smile," which is usually the first symptom, was well marked. She next observed that when playing the piano the third finger of the right hand became powerless. After resting, power returned. She also noticed that after singing a little while she would lose her voice suddenly; rest restored it. There then developed difficulty of swallowing, especially towards night; frequently liquids would run out of the nostrils. For the past year there has been trouble with vision; blurring; then diplopia. Examination showed no unbalance of the external eye muscles; diplopia occurred on forced convergence or effort at prolonged accommodation. Convergence was poorly controlled. There was at times ptosis due to general weakness. The fundi were normal (Burch). The occipito-frontalis was paretic; she could not wrinkle her forehead. The corrugator supercilii were unaffected. While eating, the lower jaw would drop down and she would have to support it with the hand; talking also caused this symptom. The arms and legs tired very quickly from exercise. On one occasion the legs gave way suddenly and she fell downstairs. While under treatment there occurred great exaggeration of her symptoms; diplopia became very marked. There was ptosis of the right upper eyelid. She was unable to raise her head from the pillow and both arms were practically paralyzed. She suddenly developed a choking spell and was apparently pulseless. She complained of cramping of muscles of the back and could only breathe by laying her head over the side of the bed. During her stay at the hospital, she experienced difficulty in urination. Her outstanding symptoms were trouble in talking and swallowing. The myasthenic reaction was present in both arms and legs. The x-ray showed the thymus to be normal.

CASE 2. Miss A., aged 20, had infantile paralysis in 1920. There was some permanent atrophy of right arm and leg and a slight limp in her walk. The left hand was smaller than the right. The only other symptom left from the poliomyelitis was a double Babinski not infrequently

observed as a left-over after this infection. The "nasal" smile was very definite. She could not pucker her lips and complained of their being stiff, making mastication difficult. She could not swallow several times in succession. There was ptosis of both upper eyelids. The head would drop to the chest. The occipito-frontalis muscle was paretic and she very imperfectly wrinkled her forehead. The face was expressionless. These symptoms were of a year's duration; walking was difficult from the first, the slightest exertion making it impossible; a short rest and it could be resumed, but finally she was compelled to crawl. The arms were similarly affected. She could write only for a short time; was unable to button her clothes, hold a pin or a spoon. Of late, when eating, the lower jaw would drop and she would have to support it with her hand. Sensation was normal. The thymus gland was normal. The myasthenic reaction was obtained in both upper and lower extremities.

In Miss E.'s case, the physiological limit was one-fifth grain of strychnia twice a day. Then she developed a hypersensitivity to the drug and was not able to go beyond a one-sixteenth of a grain. When she left the hospital, she was very greatly improved, was able to walk a little and played some on the piano. Some months later she unfortunately took a severe cold, which caused a recurrence of the old symptoms, but in a very much milder degree.

The interesting fact in Miss A.'s case was that even though she was taking a fifth of a grain of strychnia twice a day, she manifested no physiological effects. She developed a slight temperature; had a vomiting spell and grave cardiac disturbance occurred. This is easily understood, since the involuntary muscular system is also affected in this disease. The symptoms of a left lobar pneumonia manifested themselves and a few hours later she died. The ptosis and swallowing greatly improved under treatment.

In one case, Dana gave one-fifth grain strychnia twice a day; he was four weeks in reaching this dose. To another patient he gave one-seventh grain twice a day. After ninety-two injections were given, the dose was reduced to one-twelfth grain twice a day. A third patient was given one-fourth grain strychnia twice a day. In one of Dana's three cases, in which massive doses were given, a slight trouble of the eye remained; otherwise, complete recovery occurred. Drs. Jackson and Bates gave one of their patients one-fourth grain strychnia hypodermically four times a day. This case left the hospital in three weeks, and three months later was reported improving.

CARCINOMA OF THE OVARY IN A THREE-YEAR-OLD CHILD: REPORT OF CASE*

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Y. Y., a girl, aged 3, was admitted to the General Hospital, September 22, 1924. The present illness began in April, 1924, when the child was sick in bed two weeks

*From the Pediatric Department of the Minneapolis General Hospital.

with influenza. Since that time she had complained of generalized pains in the joints, with no objective symptoms and lasting for from two to four days. There was no diarrhea, vomiting, or constipation. The stools were normal. Two weeks before admission a lump about 10 cm. in diameter and about 3 cm. high was noticed on the top of the head. The first four or five days this was hard, but then became quite soft. There was no history of hemorrhage or jaundice. The past history and family history were negative.

Physical examination: The child was well developed and fairly well nourished, with marked pallor of the skin and mucous membranes. The tonsils were moderately enlarged, but not inflamed. There was a fluctuating mass about 10 cm. in diameter over the vertex. The parietal sutures were separated. There was a suggestion of icterus in the sclera. The cervical glands were enlarged, discrete, and movable. The inguinal, epitrochlear and left axillary nodes were palpable, and there was a fairly distinct enlargement of the posterior occipitals. The chest examination was negative. Examination of the heart revealed a distinct systolic thrill, most marked over the mitral area, and a diastolic murmur over the entire precordium, best heard at the base and transmitted to the back and axilla. There was no clubbing of the fingers, or cyanosis. The abdomen was protruding; the liver edge was palpable about a palm's width below the right costal margin. The spleen was also enlarged. The extremities and bony structures were apparently negative.

Aspiration of the tumor showed only blood. A spinal puncture was done, and with the exception of marked pressure the findings were negative. A study of the blood showed a marked secondary anemia; the hemoglobin was 19 per cent, erythrocytes 1,300,000, and leucocytes 14,000, with a normal differential count. Fragility tests were within the normal limits; platelet count was normal, and Wassermann was negative.

The eye-grounds were studied from time to time and showed an increase in intracranial pressure.

The first four or five days the patient was in the hospital the main trend of diagnosis was toward a blood disease, mainly the leukemias, because of the relative leucocytosis. An x-ray of the chest, however, showed some changes in the structure of the ribs, so all the long bones were rayed and showed a peculiar thinning of the cortex. A gland removed at this time showed epithelial tumor metastases with the origin undetermined, but thought most likely to be from the kidney.

The patient died twenty-four days after admittance to the hospital and autopsy showed the following: Carcinoma of the ovaries, with metastases to the liver, lymph nodes, long bones, ribs, and skull. There was also a cloudy swelling of the heart muscle.

HIND'S HONEY AND ALMOND CREAM

According to an analysis reported in 1914, Hind's Honey and Almond Cream is essentially an emulsion containing alcohol, 7.28 per cent; glycerin, 5.79 per cent; partly saponified beeswax, 5.98 per cent; crystallized borax, 1.49 per cent; perfumed with oil of bitter almonds.

(*Jour. A. M. A.*, Aug. 15, 1925, p. 539.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of September 9, 1925

The Minnesota Academy of Medicine held its Annual Meeting at the Town and Country Club on Wednesday evening, Sept. 9, at 8 o'clock. The meeting was called to order by the President, Dr. H. P. Ritchie. There were 25 members present.

The minutes of the May meeting were read and approved. The annual reports of the Secretary-Treasurer were read and approved.

The annual election was held and the following officers were elected:

President.....Henry L. Ulrich, M.D., Minneapolis
Vice President.....Frank Burch, M.D., St. Paul
Sec.-Treas.....John Eldon Hynes, M.D., Minneapolis

A motion was carried that the rules of the Academy be suspended and a unanimous vote given for the re-election of Dr. Hynes as Secretary-Treasurer.

The Secretary read a letter from Dr. E. S. Judd inviting the Academy to hold one of its regular meetings at Rochester this year. Upon motion it was voted to hold the November meeting at Rochester.

The retiring President, Dr. Ritchie, then read his President's Address, entitled "Four Men of the Academy." These being four former presidents of the Academy—Drs. Archibald MacLaren, Warren A. Dennis, James E. Moore and Parks Ritchie.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

THE NORMAL DIET. W. D. Sansum, M.S., M.D., Director of the Potter Metabolic Clinic, Dept. of Metabolism, Santa Barbara Cottage Hospital, Santa Barbara, Calif. Illus. 72 pages. Cloth, \$1.50. St. Louis: C. V. Mosby Co., 1925.

PERSONAL AND COMMUNITY HEALTH. Clair Elsmere Turner, Associate Professor of Biology and Public Health, Massachusetts Institute of Technology, etc. Illus. 426 pages. Cloth, \$2.50. St. Louis: C. V. Mosby Co., 1925.

EMPYEMA THORACIS. Evarts A. Graham, A.B., M.D., St. Louis. (Essay awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery in 1920.) Illus. 110 pages. St. Louis: C. V. Mosby Co., 1925.

OLD AND NEW VIEWPOINTS IN PSYCHOLOGY. Knight Dunlap, Professor of Experimental Psychology, Johns Hopkins University, Baltimore, etc. 166 pages. Cloth, \$1.50. St. Louis: C. V. Mosby Co., 1925.

METHODS IN SURGERY. Glover H. Copher, M.D., Instructor in Surgery, Washington University, School of Medicine, etc. 232 pages. Cloth, \$3.00. St. Louis: C. V. Mosby Co., 1925.

SYMPTOMS OF VISCERAL DISEASE. Francis Marion Pottinger, A.M., M.D., LL.D., F.A.C.P., Monrovia, Calif. 3rd edition. 86 text illus. 10 color plates. 394 pages. Cloth, \$6.50. St. Louis: C. V. Mosby Co., 1925.

ALLERGY, ASTHMA, HAY FEVER, URTICARIA AND ALLIED MANIFESTATIONS OF REACTION. Wm. W. Duke, Ph.B., M.D., Kansas City, Mo. 339 pages. 75 illus. Cloth, \$5.50. St. Louis: C. V. Mosby Co., 1925.

OCULAR THERAPEUTICS. Dr. Ernst Franke, A.O., Professor of Ophthalmology and Chief of the Second Eye Clinic of Hamburg. Translated by Clarence Loeb, A.M., M.D., Oculist to Michael Reese Hospital, Chicago. 183 pages. Cloth, \$3.50. St. Louis: C. V. Mosby Co., 1925.

EYE, EAR, NOSE AND THROAT NURSING MANUAL. Roy H. Parkinson, M.D., Visiting Oculist and Aurist to St. Joseph's Hospital, San Francisco, Calif. 207 pages. Illus. Cloth, \$2.25. St. Louis: C. V. Mosby Co., 1925.

CLINICAL LABORATORY METHODS. Russell L. Hadlen, M.D., St. Louis: C. V. Mosby Company, 1924.

This book fills a long-felt need in supplying to the library on laboratory subjects a manual describing in the briefest possible terms, the procedures which may be needed in any diagnostic laboratory. Only one method is given for each test, which contributes a great deal to brevity and conciseness. In each case the latest and most approved test is given, with the reference to the original article. No discussion of interpretation of results is presented, but, instead, merely normal findings in each case.

It is especially valuable in its treatment of the newer chemical methods of the examination of blood and urine. These are given in a very comprehensive manner and are

very easily accessible in the book. Many of the newer tests, such as the volume index, liver function, Van den Bergh tests for bile pigment in blood serum, and colorimetric determination of hydrogenion concentration in biological fluids, are given. Detailed directions are also given for making the various solutions needed in the tests and the directions are unusually concise and easy to follow. For the Wassermann technique the Kolmer is gone into with such detail that it can easily be followed by laboratory workers.

Histological methods and bacteriology, however, receive scant attention in two short chapters and this division of material is indicative of the growing importance of chemical procedures in diagnosis by laboratory methods. In general, this book is a valuable contribution to the general subject of laboratory procedures and should find great appreciation from laboratory workers throughout the country. It will, however, prove to be of less interest to the clinician since there is very little discussion of application of procedures or interpretation of results.

MARGARET WARWICK, M.D.

DIABETES AND ITS TREATMENT BY INSULIN AND DIET. Orlande H. Petty, M.D., and Wm. H. Stoner, M.D. F. A. Davis & Co.

This brief, readable textbook on diabetes is designed to cover the treatment by diet and insulin in such a manner that the average patient can easily grasp the methods of estimating diets and the technique of administering insulin at home. It is in no way intended as a substitute for the physician, but merely as a help to the patient. The book is well written and gives many valuable outlines in detail of the various diets.

JAS. N. DUNN, M.D.

FOR SALE—Late Type 120 Kilovolt Acme International X-Ray Generator complete with Filament Control for 220 Volt Alternating Current. Also Acme International Combined Radiographic Fluoroscopic Table for both horizontal and vertical fluoroscopy. Two Coolidge Tubes. Complete Dark Room Equipment. Also have some office equipment to sell. Splendid buy for someone who is just installing an x-ray department. Address C-53, care MINNESOTA MEDICINE.

FOR SALE—Microtome, practically new. M. Schanze, Leipzig, pattern. Address C-43, care MINNESOTA MEDICINE.

PART-TIME WORK WANTED IN TWIN CITIES BY A PHYSICIAN

A physician with thorough training, particularly in Internal Medicine, who is a graduate of the London Hospital and is going to work at the University Clinics, desires part-time work in the Twin Cities, especially internal medical work, laboratory work, or general practice. Best of references. Address C-52, care MINNESOTA MEDICINE.

WANTED—Office in St. Paul. Eye, Ear, Nose and Throat man desires affiliation with established surgeon, general practitioner or group. Would sublet office space. Am experienced and in good standing. Address C-44, care of MINNESOTA MEDICINE.

GOOD LOCATION in North Minneapolis for young physician with some experience. Scandinavian preferred. Address C-51, care MINNESOTA MEDICINE.

WANTED—A doctor at Newmarket, Minnesota, at once. No physician within radius of twelve miles. Good location. Inquire L. B. 107, Newmarket, Minnesota.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.